The Australian and New Zealand Journal of Surgery

APRIL, 1936.

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THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY

Registered at the General Post Office, Melbourne, for transmission by post as a periodical.

VOL. V. APRIL, 1936. No. 4.

THE HAMILTON RUSSELL MEMORIAL LECTURE.[1]

THE ROMANCE OF SURGERY.

By ERNEST W. HEY GROVES,

Emeritus Professor of Surgery, Bristol.

To those whose only idea of romance is associated with mysticism, the present may seem a prosaic rather than romantic age. Measurement has taken the place of imagination; accuracy of observation is more important than the undefined shapes of fantasy. And many will be startled at the mere suggestion of there being anything romantic about surgery. To the materialist and philistine, surgery is only the carpenter's work done for the human body, the chief object of which is the earning of the carpenter's wage. But an audience like this gathered to honour the memory of Hamilton Russell cannot contain many who are only materialists and philistines.

To men of larger vision and wider aims the science which is the proud heritage of the last century and this, represents romance in its most lofty and most thrilling aspects, and surgery which brings the discoveries of science into relation with the human body is, or should be, the most romantic branch of science.

The romance of science and of surgery includes three among many other elements. First, there is the spirit of adventure, which, in dealing with the infinite mysteries of life, sets out to find something new and to apply it for the good of mankind.

Just as in Elizabethan times men were dominated by the unconquerable desire to push out into the unknown world and to discover new territories, just as they employed the absurdly inadequate little boats to venture into unknown and uncharted seas, so does the scientist ever

[1] Delivered at a meeting of the Royal Australasian College of Surgeons, Melbourne, September 12, 1935.

strive to penetrate a little further into the infinite and to capture something to add to the possessions of all mankind.

This romantic spirit of adventure is always actuated by the inspiration and pursuit of ideals—those visionary and unattainable fantasies, which, whilst always drawing men on in seemingly vain pursuit, enable them to march forward, to conquer fresh kingdoms and to stand on fresh viewpoints from which the promised land still beckons.

In the march of science all men start equal, but quickly they become spread out according to aptitude and perseverance, and to a less extent by lucky chance. Untold millions of men have started on voyages of exploration, but it is given only to the lucky few to be a Columbus or a Cook. And so in each branch of science, though the workers may be a great multitude, the real leaders and discoverers are few. Some such leaders so far outstrip their fellows as to be lost sight of, and it is only after they are dead and gone that their footsteps are followed. Others always take a band of disciples with them, who blaze the trail and colonize the new territories of knowledge. These leaders are the heroes of our romance, and hero-worship is an honoured tradition, although usually it is not considered decent to worship a man until he is dead.

The romance of surgery then includes at least these three things—the spirit of adventure, the pursuit of unattainable ideals and the worship of heroes.

We have met today to do honour to the memory of Hamilton Russell, a scientific surgeon whose life was an embodiment of all these things. His own innate modesty forbade him to take pride in anything but the fact that he was the pupil and house surgeon of Lister, whom he ever delighted to honour and to imitate.

I cannot pretend to tell you anything that you do not know about Hamilton Russell, but I feel bound by the honour you have done me in asking me to give this first lecture in his memory, to set on record the main facts of his career as collected from such sources as are available to me.

He was born on September 2, 1860, at Chartham, Farningham, Kent, the younger son of James Russell, a farmer. We do not know what turned his mind towards a medical career, but he became a student at King's College, London, and later at King's College Hospital, obtaining his conjoint qualification (M.R.C.S. and L.R.C.P.) in 1882. His first appointment was that of resident *accoucheur* under Dr. William Playfair, and he then became house surgeon to Mr. Lister. He tells the simple story of how Lister one day, coming into the hospital, whilst he went upstairs with his house surgeon, showed the latter a letter from Mr. Gladstone, in which Queen Victoria offered him the honour of a baronetcy. It was shortly afterwards that Sir Joseph Lister resigned from the active staff of the hospital, so that Hamilton Russell was actually his last house surgeon.

Acting on Lister's advice, he took a post as house surgeon at the Salop Infirmary, Shrewsbury, which he held for two years, and he then

proceeded to study at various continental hospitals, taking his final fellowship of the Royal College of Surgeons of England in 1889, after which he decided on the great adventure of proceeding to Australia, being largely actuated by considerations of health. He travelled by the steamship *Carlisle* from London to Melbourne.

I do not know whether he was officially the ship's surgeon, but he was the only doctor on board, and it was on this voyage that occurred the case which was the subject of his first publication, and which proved his courage and resource. A sailor of seventeen was almost thrown overboard by a heavy sea and sustained severe strain to the abdomen. This was on October 10, 1889. For nearly a month the patient suffered from abdominal pain, constipation and finally vomiting. Russell treated him alternately with aperients and opium, and when vomiting was of repeated occurrence advised operation. He performed this operation in his own cabin, with the assistance of two laymen, first putting the patient under chloroform. There was a kink in the colon near the splenic flexure, which was thought to have been forced through a tear in the mesentery. The patient made a good recovery. (*The British Medical Journal*, Volume i, 1890, page 1296.)

He settled in Melbourne, the scene of his life's work as a surgeon and a teacher. He was unknown and without influence, so that at first he had to be content with general practice in Hawthorn. His first attempt to leave this uncongenial work was fortunately unsuccessful. He applied for the post of medical superintendent of the Horsham Hospital, but was turned down because it was regarded as suspicious that a man of his brilliant attainments and experience should apply for this appointment.

But in 1892 he was appointed to the surgical staff of the Children's Hospital, Melbourne, and he also became a demonstrator of anatomy at the University. It was whilst holding these appointments that he worked out the saccular theory of hernia, which he published first in 1898 and 1899. This is probably the work by which the scientific world will remember him best. He certainly established the outstanding importance of the congenital origin of the sac in the causation and treatment of hernia in the inguinal region and perhaps not so convincingly in the femoral. He was responsible for the slogan: "The sac, the whole sac, and nothing but the sac."

In the meantime he had written papers on subcoracoid dislocation of the humerus, the operative treatment of hydatid disease, cancer of the breast, the dangers of chloroform, the early diagnosis of hip disease, cystic dilatation of the common bile duct in a child, fracture of the neck of the femur in childhood, fissures of the skull, cases of head injury, and dislocation of the elbow (between 1890 and 1900). This list shows both his energy and the breadth of his interests in surgical subjects. In 1901 he was appointed to the staff of the Alfred Hospital, where he had much larger scope than hitherto for his energy both in clinical observation and teaching. He continued to hold this appointment for twenty years, when he retired at the age of sixty.

He had not been long on the staff of the Children's Hospital, or the Alfred, before he was recognized by his colleagues as a leader, although he always presented himself as merely a follower—a follower of the immortal Lister. Every week-day morning, and often on Sundays, he visited his wards. It was the hospital ward which constituted his main field of observation and research—researches which had been begun in the dissecting room and followed up to the operating theatre. He paid great personal attention to the dressing of wounds, and insisted on careful and accurate note taking. He always aimed at simplicity, both in operative technique and surgical appliances. This characteristic of his work was displayed in his very simple and effective method of treating fractured femurs—a method which is now widely practised and known as the "Melbourne method".

In addition to numerous articles on the nature and treatment of hernia, he wrote on hypospadias and on the treatment of stricture of the urethra by excision, osteomyelitis, tuberculous disease of joints, cervical caries, neurectomy, removal of a pin from the lung by pneumotomy, intussusception, sacro-pelvic teratoma, access to the knee joint by section of the patella, hydatid disease of the liver, bone grafting, cleft palate, rupture of the bladder complicating fracture of the pelvis, treatment of war wounds, fractures.

His work on the excision of strictures of the urethra was probably his greatest contribution to surgical technique. It was a great pity that he could not present this to the surgical world thirty years before he did, at a time when severe urethral strictures were so common. But his method will always remain as the most suitable method for traumatic stricture and the occasional inflammatory stricture which has eluded the modern venereal department and defied the urethrotomist.

In common with most of us who were in active practice at that time, Hamilton Russell's surgical career was interrupted, or enlarged, by the experiences of the Great War. He happened to be in England in 1914, and volunteered to serve with the Expeditionary Force in France, which he did for a short time. After returning to Melbourne, he continued his military surgery at the Alfred Hospital and also at the special military hospitals at St. Kilda Road and Caulfield.

When President of the Medical Society of Melbourne, in his inaugural address he reiterated his original views about the causation of hernia and strengthened his arguments by his greatly extended experience.

After his retirement from the staff of the hospital, he was actively concerned in the formation of the Royal Australasian College of Surgeons, being a member of its first Council, and at the time of his death Censor-in-Chief in control of admissions to the fellowship. In March, 1930, he was presented with his portrait, which hangs on the walls of the College today. In making acknowledgement of this gift, in a characteristically modest speech, he attributed all his success to the good luck he had had in his association with Lister. Apart from his work and his joy in the association with colleagues, friends and students,

his chief solace was in music, playing the piano himself and never neglecting the opportunity of asking musicians to his house.

It was on account of his health that he first voyaged to Australia, and in later life he suffered much from osteoarthritis of the hip. His end came with tragic suddenness, after a motor accident on April 30, 1933.

The presentation of his portrait and the inauguration of this lecture are evidences of the esteem of his colleagues and the devotion of his friends.

It would be an impertinence for me, a visitor from far distant England, to attempt to give to you, who knew him personally, an appreciation of his character. I will content myself with emphasizing the points which have struck me most in studying his life and work. The glorious adventure of surgery was his life's devotion and inspiration, and he found in it enough to absorb his whole time and energies. He early adopted the religion of hero-worship and formed his ideals of research and practice on those of Lister. Unconsciously then, in his turn as torch-bearer, he became a hero to students, house surgeons and colleagues, and did much to establish the fame and traditions of this Royal Australasian College of Surgeons.

I have already defined what I mean by the romance of surgery, and I have tried to illustrate my idea by the life of Hamilton Russell. I will now expand my theme by a brief consideration of the tradition of the past, the problems of the present, and the ideals of the future.

THE TRADITIONS OF THE PAST.

Man as an animal is not so strong as the lion or the gorilla, not so swift as the eagle, not so long lived as the elephant, nor so well organized in community work as the ant or the bee. But his intelligence has given him this great superiority over the beasts that he is able by spoken and written language to register and hand on his discoveries from one generation to another. Thus the theory, speculation and discovery of each age become the working rules of the next. The wild unknown country is discovered by the pioneer and colonized by his successors.

We do well to take pride at all times, and especially on an occasion like this, in looking back on the work of those great heroes which has made the present science of surgery possible. For the moment I must content myself with considering only three of these, namely, Lister, Hunter and Röntgen.

John Hunter is our Patron Saint, as it were, in your sister College in Lincoln's Inn Fields. The oration founded in his honour in 1814 has now been delivered seventy-eight times, and each orator has found something fresh to say as to Hunter's life, work and influence on surgery. He it was above all others who raised surgery from an empirical cult to that of a reasoned science; and yet he himself was unmannered, uncouth and unlearned. A large amount of what he wrote was unintelligible, and much of it untrue. His greatness lay in the lofty character of the

ideals which he pursued and the passionate earnestness of his pursuit. He set himself no less a task than that of discovering the nature and origin of life. In this endeavour he amassed the largest collection of dead animals, both fossil and recent, that ever has been brought together by the labours of one man. He actually bequeathed to the College of Surgeons in London 13,600 specimens which he collected, and many of which he himself dissected. This represents one new specimen a day for every working day of his life for forty-five years from the age of twenty to that of sixty-five! His passion for work was such that it kept him up till midnight writing and awaked him in the early hours of the morning, when he was wont to begin his dissecting. His zeal for experimental work was such that he actually made himself the object of his greatest experiment, which succeeded so well as to inoculate him with the disease which finally caused his own death. He may not have achieved his own ideal, for we still do not know what life is or whence it comes, but he set men thinking and searching as they had never thought or searched before.

Lister was a hero of quite another type. Gentle, courteous and modest, he hated the turmoil of strife with his fellow workers, which Hunter loved. But he took up the trail of scientific research which Hunter had blazed before him, and pursued it until he had discovered the greatest thing in modern surgery, the nature of septic infection and the means of its prevention.

Men of his own country in his own generation were slow to recognize Lister's genius and the greatness of his discovery, which were quickly acclaimed on the Continent. But he impressed himself on the younger generation, so that almost every one of his house surgeons became first a devoted disciple and later a torch-bearer. Such a disciple was Hamilton Russell, who later went to what we think of as "the ends of the earth" and what you think of as the "hub of the universe". Melbourne, in Australia.

Lister's achievement was brought about by patient investigations carried out both in the laboratory and at the bedside. He himself would have been the first to have acknowledged that he owed his discovery to a large extent to the work of the great Frenchman, Pasteur, who ought always to share with Lister the glory of the knowledge of the germ theory of disease and the prevention of septic infection.

One of the glories of science and of surgery is that they know no frontiers. For scientists the whole world is their realm and the whole human race their study. French, German, Japanese, American and British scientists are a band of brothers and their work is for all mankind. This, the highest and truest brotherhood of man, holds out the greatest chance of the ultimate achievement of universal peace with progress.

I shall speak of only one more giant of the past, one who died only twelve years ago, Wilhelm Conrad Röntgen. Like Pasteur, he was not medical and belonged not only to another nationality, but to the one with which we have had the most deadly conflict.

And yet his discovery, given to the world before the War, was used then and since for the benefit of all mankind. It is particularly fascinating to those of our age to trace the growth of this discovery. I can remember so well its announcement, when I had just qualified. At first how sceptical we were, and then how we thought that it was only going to be a scientific toy, or curiosity! How superior many of the older surgeons felt themselves to be in regard to its use in the diagnosis of fractures! It was held by many that clinical skill and acumen must be at fault which needed this new-fangled invention as an aid. But now the magic rays from Wurtzburg have come to enlighten not only the bone surgeon, but also the worker in every other department of medicine.

Wilhelm Conrad Röntgen (1854-1923) was a German physicist, whose life and works form a link between the nineteenth and the twentieth centuries. Born at Lennap in the Rhine Province, of a cloth merchant, he gave no special promise of distinction in his school life, which was at Utrecht. In fact, the only notable events were disasters. He was expelled from school because he refused to divulge the name of one of his fellows who had given him a caricature of his teacher. And then he failed in his "absolutorum" examination to the university, and he had then to go to study in Zurich. However, as soon as he had decided to devote himself to pure physics, his industry and accuracy in observation soon gained him academic distinction. After being a *Privat-docent* at Strasburg, he held the posts of Professor of Physics at Giessen, Wurtzburg and Munich.

His epoch-making discovery took place whilst he was working by himself in his laboratory in Wurtzburg with a Crookes tube covered with black paper, and he observed the illumination of some crystal of barium platino-cyanide. His acute mind and intensive training enabled him to grasp the significance of his discovery, and after feverish days and weeks he presented his preliminary communication on December 18, 1895, and a more detailed account early in the following year. At the time of the discovery of X rays, Röntgen was fifty years old, and his paper was actually the fiftieth scientific publication which came from his pen.

Probably there has never been a discovery which so literally took the world by storm, or the importance of which was so quickly recognized and its author so generously honoured and acclaimed. The irony of the situation was that there was never a man who liked publicity and acclamation less. He received the Rumford Medal of the Royal Society of London in 1896, and the Nobel Prize in 1901, and besides these there were innumerable honours by German and foreign countries. He refused the title of nobility which was offered to him in Bavaria.

Röntgen's outlook on life is best explained by two references to his own words and opinions. In 1894, in rectorial address at Wurtzburg University, he said:

> Every genuine scientist, whatever his line, who takes his task seriously, fundamentally follows purely ideal goals and is an idealist in the best sense of the word.

And in 1901, when talking with his colleagues after he had received the Nobel Prize, he said:

> The greatest and most beautiful joy the scientist can experience is unprejudiced research. Compared to the inner satisfaction over a problem successfully solved, any outside recognition becomes meaningless.

He suffered terribly during the War, both from mental anxiety and from the loss by inflation of all his savings, including money prizes. His only consolation was the knowledge that his discovery was of incalculable value to the wounded, and he received the Iron Cross from von Hindenburg in recognition of this fact.

Lister and Röntgen have many things in common—a selfless devotion to work, the inspiration of a noble ideal and a modesty which shrank from public acclamation. It is a happy thought that whilst each achieved the ultimate glory of winning one of Nature's secrets, so each gave his secret to the whole world for the benefit of common humanity.

And so the romance of surgery has been carried on in the past by the labours and discoveries of giants and heroes. In the eighteenth century John Hunter laid the foundation of anatomical and pathological research. In the nineteenth century Lister, adapting the discoveries of Pasteur, made surgery safe; and before his new ideas had been universally applied Röntgen brought to us one of the marvels of physics which now enables us to see where formerly we could only guess.

THE PROBLEMS OF THE PRESENT.

Everyone who pauses to reflect on the things which have happened in surgery in his own lifetime is struck with wonder at the rapid advances which have taken place. Every advance brings us to a newer and higher viewpoint whence we can see ever widening tracts of country. Two inexorable facts dominate Nature and human affairs—infinity and mortality. There can be no limit to our discoveries, but no one man can lead the search for more than a fraction of time, after which he departs, leaving his heritage behind him.

Every year sees an increase in the number of workers in every branch of science, including surgery. Old universities are enlarged, new universities are springing up. Grants and endowment for research are making it possible for many more to devote themselves to research. As plain evidence of the increase of work and of workers, we may take the volume of literature which appears year by year. In a lazy mood, one is almost tempted to envy the medical man of fifty years ago, whose current literature was confined to *The British Medical Journal* and *The Lancet*. And I can remember the time twenty-five years ago when a surgical reading society of ten members, each of whom took in one foreign journal, were able to keep *au fait* with English, American, French and German writings. But now the increase of printed surgical matter is such that there is devoted to one small speciality, such as radiation or cancer research, much more than was given to the whole domain of surgery fifty years ago.

This rapid and great increase of surgical work has involved not only more workers and more literature, but also more subdivisions, or, as we call them today, specialities. Bacteriology, which began as such a little thing with Pasteur's microbes and Koch's bacilli, is now a science with many subdivisions.

Radiology, a very simple matter when the vacuum tube was made to give a shadow of the bones, has now become the imposing study of radiography and radiology, meeting in its progress the twin sciences of radium therapy and radiotherapy, which both together attack the problem of the treatment of malignant disease.

Biological chemistry, which seemed to be born only yesterday, but really is quite old, except for the name, has now grown up to the stature of a vigorous and rather dominating science. The mysteries of calcium metabolism seem to be involved in every phase of tissue growth, from the phenomenon of blood clotting, which so fascinated both Hunter and Lister, up to the vagaries of the parathyreoid glands, which in some part control the ossification and growth of the skeleton. The advance of safe surgery not only depends on biochemical advance, but also every wise surgeon gets the biological chemist, or I should like to call him the clinical physiologist, to help him with data in every obscure case.

Cancer research again is a subject which arose first from Hunter's insistent determination to know the nature of diseases, and then from Pasteur's and Lister's discovery of the nature of germ diseases. It still goes on, a laborious search for the cause and cure of an evil enemy of the human race. The search for the elusive germ, the proof that no germ can be its cause, the rediscovery of another and even more minute germ, the filterable virus, the myriads of lower animals sacrificed to yield the secret, the ultra-microscope and now the emanations of radium, all form part of this romantic quest to understand but one small phase of life.

Every few years there is a special development in some new branch of surgery. At first, after Lister's day it was the prevention of septic infection. Then came the conquest of the abdomen, and then that of the chest. And now attention is focused very much on the surgery of the brain and the sympathetic nervous system. Cushing's patient work and the use of electric cutting devices have made it possible to remove safely large parts of the brain. It was your countryman, Royle, who was one of the pioneers of modern work on the sympathetic nervous system. Now there is no ganglion or strand of the sympathetic nervous system which is not exposed or removed for various conditions of pain, paralysis or dysfunction. Dr. Beattie, the Curator of the Royal College of Surgeons in London, has explained to me that there is a cerebral centre for the control of all sympathetic functions, but although he can locate it with nicety in the depths of the cat's brain and either stimulate or destroy it, he assures me that this is not for the surgeon. When one reads of all the benefits which accrue from ablations of parts of the sympathetic system, one cannot help wondering why the good

God put it there at all, for everyone seems better in every way when he gets rid of it. But of course the same question has been asked about the *appendix vermiformis*, which may be only a useless vestigial structure, but which has proved a friend in need to many a rising surgeon.

Another very real present-day problem is afforded by the multiplication of the number and variety of hospitals. In the old days the only reason and justification for hospitals was the charitable desire that poor people should be housed, fed, nursed and doctored during illness. No person who had a house and servants, and who could be attended at home, would have thought of going to hospital. Actually the hospitals in those pre-Listerian days were hotbeds of disease and infection. But since surgery has become a science and since all manner of investigations are necessary for the diagnosis and treatment of disease, the hospital has become the essential and necessary place where all serious surgical work must be done. It is no longer a question of a man of means being treated at home whilst the poor man is sent to an institution. Every patient who is the victim of a serious accident or illness must be taken to an institution, both for investigation and treatment. Unfortunately this changed relationship of hospitals to the community has come about so slowly that it was not realized, and there are many even today who do not appreciate its significance. And therefore we have the present-day muddles of various types of institutions provided for the sick, without clear definition of the scope of each, or the proper relationship of one to another. In the first place there are the voluntary hospitals, which until the beginning of this century did nearly all the important work necessary for acute illnesses or accidents. In our country it is usual and right to express admiration and gratitude to the voluntary hospitals, which have been the scene of nearly all the advances of discovery and technique. But, however sincere may be our admiration for their work in the past, we are bound to criticize their present position and their relationship to the whole public health service.

The voluntary hospital is essentially an institution to some extent endowed and wholly managed by private individuals. At one time they were supported entirely by voluntary subscriptions, and the patients themselves were treated free of charge. Now this is all changed. A large proportion of their maintenance charge has to be borne by fees paid by the patients, but in spite of this and of the shameless begging which is enlisted to their aid, they are all finding it hard to live, while extensions and improvements have to be delayed till some wealthy benefactor can be found to present them with the needed money. To me this has always seemed wrong in principle and bad in practice, and I have always protested against the indignity of medicine being a mendicant. But this is aside from my present purpose, which is to point to the essential fault in the voluntary hospital system which constitutes one of the real problems of the day. That is the much vaunted independence of control of the voluntary hospitals. I say with all the emphasis at my command that the time has come when every hospital which undertakes the treatment of the sick and the investigation of

disease must come under public control, for example, the Ministry of Health. In the first place it should be no longer possible for a private person to give or bequeath a hospital to the community without inquiry, by the Ministry of Health, as to how the hospital is to be supported, as to whether it is needed, and, above all, as to how it is to be staffed. It is due to these promiscuous benefactions in the past that we have innumerable hospitals, mostly in country and outlying districts, which are a great drain on the medical and financial resources of the country, and which are of very questionable benefit. In the city about which I am most qualified to speak there are about 400,000 people, and upwards of twenty hospitals and dispensaries, of which ten are voluntary hospitals, of sizes of from 350 to 20 beds. Every one of these owes its origin to the beneficent charity of individuals or groups of individuals, most of them owe their continued existence to further munificent bequests, and all of them are dependent upon patients' fees and organized collections. In addition to philanthropic motives, almost all voluntary hospitals have some sentimental reason for their inception. One is conservative and Church of England, another is radical and Nonconformist, and most of the others represent the bequests made by rich men in their wills or memorials to those whom they wish to honour. So long as hospitals were really hostels for sick people, this uncontrolled multiplication had no special drawback, except that it was wasteful of money and personnel.

But now that the hospitals represent a scientific clinical laboratory, in which the work must be highly differentiated and specialized, it is obvious that multiple small hospitals with no connexion with one another and no responsibility except to their own directors, are an absurdity. Business men will realize how much money is wasted in unnecessary overhead charges. Elaborate and costly scientific equipment has to be provided over and over again where single sets would serve. But most serious of all is that the necessary specialization which any highly organized science requires is terribly handicapped by shortage of experts, and limitation of the field in which these experts can work. Take certain specialities, for example, cancer treatment and deep X ray therapy. What chance is there of the difficult problems of cancer treatment by radium, X rays, colloidal metals and the cognate problems of biological chemistry associated with these things, being adequately handled in twenty hospitals in one city? Actually there are only two hospitals in Bristol which could make any pretence to carry out this work; but then many of the others are taking and treating cancer patients. Either this work is unnecessary waste in the hospitals which do it, or it is neglected in those which do not. Then take the subject of deep X ray therapy, with its £25,000 equipment, its powerful and its dangerous apparatus. Such equipment is certainly necessary for every big city, but the type of man, a highly qualified medical man and physicist, who can be trusted to work it, to get good results and to advance our knowledge, is very difficult to find, and it is folly to think that every hospital which can find £25,000 for the plant can also discover the expert.

The same argument applies to all other specialities—ophthalmology, oto-rhino-laryngology, biological chemistry, orthopædics *et cetera*. Every general hospital requires all these, but within certain limits: the more these departments are multiplied, the less will be their efficiency. Therefore I repeat that the uncontrolled independence of the voluntary hospital presents one of the most urgent problems of the day. Either the voluntary hospitals must set their own houses in order and set up a council of government which shall be concerned only for the good of the community and of scientific progress, or else the State must step in and control them. Maintenance must be met by insurance instead of by mendicancy, and new hospitals and new buildings must be provided by the public funds. The examples of universities show that it is quite possible to obtain State aid without State control.

I can only touch very briefly on two other types of medical institutions, namely, the municipal hospitals and the nursing homes. The municipal hospitals, although the direct descendants of the Poor Law institutions, have now been placed on a far higher level as regards buildings and personnel. In most of our large cities they represent the best buildings, and are placed on the best sites. They are unhampered by any financial stringency, and in regard to the actual number of beds provided, they have outstripped the voluntary hospitals, and threaten to do so more every year. Their chief drawback at present is inadequacy of the medical staff in point of numbers and qualifications as specialists. But this drawback is being remedied by appointing specialists, who for the most part are drawn from the staffs of the voluntary hospitals. The large size and rapid growth and wealth of the municipal hospitals, in comparison with the stationary size and encumbered state of the voluntary, have compelled the latter to cooperate with them. But at present this cooperation is rather reluctant than wholehearted, and needs to be fostered by both parties, so that each city and county shall have a really unified hospital service for the benefit of the community.

Nursing homes, too, are slowly being improved, so that every city now has two or three large homes well built and equipped, and managed either by a group of medical and lay persons or else by nursing sisterhoods. Let us hope that the force of circumstances will speed up the disappearance of proprietary nursing homes, which are surely an anachronism today. But in the future all the best hospitals should have ample accommodation for private patients who can pay their own fees and maintenance charges and who at the same time get the benefit of all the refinements of scientific medicine and surgery.

The last problem of today that I would ask you to consider is the need for more thorough and efficient carrying out of treatment by cooperation and team work. Individualism among men has been as great a bar to progress as the independence of hospitals. It may be the wish of the individual surgeon to practise the whole of what is called "general surgery". But manifestly this wish must have its limitations, and most general surgeons have not only given up ophthalmology and oto-rhino-

laryngology entirely, but are willing to recognize that each surgeon can be really an expert in only one branch of general surgery; and coincidently no important branch of general surgery can be brought to the highest perfection unless it is practised by specialists. Hence the more highly organized hospitals have special surgeons for the surgery of the brain, the uro-genital organs, the chest, orthopædics and plastic surgery. The justification for such specialism is found in the growing size of each subject, whether judged by literature or new technique. But if any medical man needs to be convinced, then it is only necessary to ask him whether if he or his child had a brain tumour, a hydronephrosis, a bronchiectasis, a club foot or a cleft palate, he would be content to place himself or his child under any but one who had got special knowledge and experience in that subject.

And yet with all these specialisms, one big subject, the importance of which is growing every day, still remains unspecialized and the happy hunting ground for general practitioners and general surgeons. I refer to the subject of traumatic surgery and more especially to that of fractures. The experience of the War proved beyond all doubt that the most important factor for success in the treatment of fractures was organization. It was this rather than the discovery of any new method which brought down the mortality of gunshot fractures of the femur from 80% to 10%.

Sir Robert Jones, the greatest orthopædic surgeon of our nation and time, who was largely responsible for this organization, has urged the importance of carrying out this principle in civil surgery. He deplored the fact that all sorts of unnecessary crippling disabilities were caused by fractures being treated by junior, inexperienced surgeons, or by surgeons who had neither the interest nor enthusiasm for this work, and, above all, by cases being passed from one hand to another, just as was done in the early days of the War and with the like disastrous result.

He constantly expressed these opinions and did so formally in an address to the British Orthopædic Association, and yet but very little has been done, so that a special committee of the British Medical Association, reporting this year, had to point out that the general standard of fracture treatment in Great Britain fell so far short of the ideal that the average patient took three times longer for his recovery and had a 30% greater risk of suffering from permanent disability than if he had been treated in an organized clinic. To all those who knew and worked with him, Sir Robert Jones was a hero whom we delight to honour. But let us make this hero-worship a practical thing and not merely a lip service. Traumatic surgery and the treatment of fractures in particular must be made a speciality, dealt with by a trained team of surgeons and nurses at every large hospital, whether voluntary or municipal. A hospital with no fracture clinic should be regarded as out of date, as one in which the diseases of ears, nose and throat are scattered among general wards, if such a hospital still survives. A good fracture clinic having been established in every large

hospital, a proper fracture service must be organized in the country districts by a mobile system of motor transport by which specialists can supervise country work, and bad cases can be brought into the city clinics. This is a problem the solution of which lies ready to our hand. When it has been accomplished, an efficient fracture service will afford a fitting memorial to Sir Robert Jones, and one which I venture to think would give him far greater delight than any personal tribute.

IDEALS OF THE FUTURE.

The ultimate ideal of medical science is of course the prevention of disease. The fact that this ideal is impossible of attainment makes it none the less worthy of pursuit.

The first step in the attainment of this ideal must lie in the closer cooperation of science with art, of physicians with surgeons, of physiologists and biological chemists with the craftsmen of surgery. The importance of this line of advance has been recognized by Lord Moynihan, who, whilst President of the Royal College of Surgeons, initiated a scheme for coordinated research and its clinical application, which by the munificence of Sir Buckston Browne has been begun at the Downe Research Farm. In this spot, already famous as the home of Darwin, young surgeons and physiologists work out new ideas which are given clinical application in due course. Physicians and surgeons must not be rivals and competitors, but co-workers for a common end. Take, for example, such a disease as gastric ulcer. The patient should, according to this ideal, always be under the care of both physician and surgeon and not handed backwards and forwards from one to the other. If the physiologist and radiologist are called into cooperation, severe ulcers will be prevented, and the surgery which involves mutilation will become the exception rather than the rule.

In aiming at the abolition of disease we may consider four types of disorder. First, diseases due definitely to microbic invasion. In this Lister has set us an encouraging example so that septic infection has been rendered preventible and is prevented. We are well on our way to the conquest of syphilis and tuberculosis, and the fact that much more progress has not been made is the fault of social and economic conditions rather than of medical science. Then there is the problem of cancer in all its varied forms. He would be a bold man who could predict when this problem will be solved, but it would be a pusillanimous one who declares it to be insoluble. Already much has been done to cure and relieve the sufferers from this disease, and in the use of radiation and the colloid metals we have something better than mere mutilation.

Diseases due to faulty physiology, such as those of the thyreoid and other endocrine glands, are among those in which the prospect of cure without cutting is reasonably near.

Many diseases and certainly some forms of osteoarthritis are in reality merely a form of senility, and future generations will have to

choose between the sufferings associated with growing old and euthanasia. There must always remain the prevention, cure and alleviation of deformities which are of congenital or accidental origin, so that orthopædic, traumatic and plastic surgery will necessarily become of increasing importance. I have already indicated why this department of our work should be set in order, and its proportionately increasing importance in the future is one more reason for energetic reform.

A lecture of this kind may benefit a few or many, but certainly its preparation is good for the lecturer. I have spent many happy hours in pursuing my vision of the romance of surgery in the past, present and future. If you have been wearied by what has seemed to you rather a jumble of disconnected ideas, the fault lies not with the vision of romance, but with the one who has attempted to describe it. The two men to whom I owe most for teaching me the practice and ideals of surgery are Sir Robert Jones and Lord Moynihan. The latter will, if ever he reads this, recognize many of his ideas and phrases expressed so much less eloquently than if they had come from his own mouth.

It is a fine thing to follow a great man, as Hamilton Russell followed Lister.

It is a noble tribute to a man's memory that his fellows have thought so well of him during his life that they wish to continue to think of him and to follow his example after his death.

It is such a tribute which we pay to Hamilton Russell today, and I am deeply sensible of the honour you have done me in asking my hand to lay this, the first wreath, on his shrine.

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OVARIAN HORMONES AND THEIR RELATION TO BREAST TUMOURS.

By Dean Lewis,
Baltimore, Maryland, United States of America.

Cystic disease of the breast was first recognized about one hundred years ago. In Lecture XIII, which appears in "The Principles and Practice of Surgery", written by Sir Astley Cooper and published in 1835, appears the following:

> The diseases of this organ have been too much considered as being of a malignant nature; and the females who have had the misfortune to have tumours in their bosoms have often been very unnecessarily submitted to an operation under the idea of the complaint being cancerous. I shall, therefore, proceed to state what I have been able to learn from various diseases of the organ, to discriminate the malignant from the more benign complaints, and to point to cases which really require removal in distinction from those in which the operation is entirely unnecessary.
>
> Symptoms:
>
> This disease begins in a swelling which is unattended by pain and which has the character rather of chronic inflammation in a part of the breast than as bearing a resemblance to a scirrhous tubercle, for it has neither the mobility, its excessive hardness, nor its circumscribed or distinct limits; but it incorporates itself with the surrounding parts of the breast. The skin over the mammary gland is undiscoloured, and the part is scarcely tender to pressure. The general health is unaltered, even when the swelling becomes of formidable magnitude.

Cooper gives the following account of the pathological changes:

> A change in the nature of the swelling occurs as it enlarges. At first it is uniformly solid, but afterwards distinctly divided into a solid and fluid part, the latter fluctuating so as to inform the surgeon of the existence of fluid. If this part be punctured, a liquid having the character of serum is discharged, but the swelling soon becomes distended again and continues to grow. At length the tumour acquires enormous magnitude, and some of the largest swellings in this organ are of the hydatid kind. I have twice seen swellings, not of this description, rather larger than the hydatid; but generally the largest of the breast are of this kind. From Mrs. King at Charing Cross I removed one which weighed thirteen pounds, but frequently they are removed when still small, under a supposition that they are scirrhous tubercles.
>
> It is a complaint I have seen at all ages after twenty, but more frequently in advanced age than in youth.

In describing some of these cases Cooper observed that over the fluid part of the cyst there was what he described as a slight blue dome. This is the first mention of this feature, the significance of which Bloodgood has emphasized so often during the past few years.

There may be some doubt as to whether all the cases described by Cooper were cystic disease. The size might indicate that the tumour

was a *cystosarcoma phyllodes* or some type arising from the intercanalicular connective tissue, for certainly such enormous enlargements are not encountered in cystic disease as we see it today. Cooper was, however, apparently the first to recognize cystic disease and differentiate it from scirrhous tubercle.

Brodie was the first to realize that cysts developed in the milk ducts and to attach some significance to the absence of lactation. Lecture XXIV was published in 1846. It was devoted to cystic disease of the breast. The following appears in the published lecture:

> The disease which I propose to treat on the present occasion is an affection of the female breast. It is one of great interest in various ways, and among others in this, that in its advanced stages it is liable to be confounded with carcinoma, although it is not really of malignant nature. I should not have been able to trace its exact history if I had trusted altogether to my hospital experience. Yet I have not met with any description of it in books corresponding to what I have observed of its actual progress. You will presently see how this is easily explained by the disease assuming a wholly new character as it proceeds, so that if you were to look at two cases of it, one in the early and the other in the more advanced stage, without having witnessed the intermediate changes which have taken place, you would scarcely be able to recognize their identity. Let me not, however, be misunderstood as to representing that no notice whatever has been taken of it by surgical writers.

The account which Sir Astley Cooper has given of the hydatid breast has been taken principally from cases of this disease, and there have been allusions to it in the treatise on "Diseases of the Breast", lately published by Velpeau.

The first perceptible indication of the disease is a globular tumour embedded in the glandular structure of the breast, and to a certain extent movable underneath the skin. Sometimes there is only one such tumour; at other times there are two or three, or many more. The examination of the breast in the living person does not enable you to determine the exact number which exists, as it is only where they have attained a certain magnitude that they are perceptible through the skin. In most instances the disease is confined to one breast, though it is by no means uncommon for both breasts to be similarly affected.

The globular form which the tumour invariably assumes in the first instance is sufficient proof that it is formed of fluid collected in a cyst. I am led to suspect that the cysts are originally formed by the dilatation of the lactiferous tubules. I have never known the disease to occur previously to the age of puberty, nor after middle life, and if I am not much mistaken it is more common in single than in married women.

Brodie's contributions to cystic mastitis were the recognition of the age incidence and the frequent occurrence in women who had not lactated. The correctness of the latter observation may be verified by an examination of a series of cases. It controverts the conclusions drawn by Deaver and McFarland that many of the cysts represent residual lactation acini.

The observations made by Reclus deserve comment. They are as follows. The first characteristic is the extreme abundance of the cysts.

Without doubt, one would be able to count by the naked eye at least fifty, but microscopic examination shows innumerable cysts, not only in the tumour itself, but disseminated throughout the entire gland. The second characteristic is that in this specific disease one finds cysts in the acini and in the milk ducts, and in all the lobes and lobules. The third characteristic is the involvement of both breasts. The occurrence of tumours in both breasts is uncommon, but we have found in the cases which we have studied cysts in both breasts. It is perhaps because both breasts are affected that the lesion has been unrecognized as cystic in character. The disease very often is characterized only by irregularities on palpation, associated at times with but little pain. To the ordinary clinician the lesion might be regarded as a constitutional physiologic phenomenon.

Schimmelbusch's observations were somewhat different from these just given. He states that the disease is often confused with carcinoma and treated as such. The first four cases treated by Reclus were thought to be malignant. At times the lesion has been confused with a fibro-adenoma, with which it has nothing in common. The disease, however, is clinically as well as anatomically so definite in its manifestations that it is not difficult to separate it from other diseases of the breast.

The following are the characteristics of the cystic disease of the breast described by Schimmelbusch:

1. Diffuse involvement of both breasts. The growths in most cases are the size of a pea or bean, rarely larger.

2. The lack of any connexion with neighbouring structures; for example, the skin, which is freely movable on the involved breasts.

3. The bilateral involvement, both breasts being affected at the same time; or the second a short while after the first.

Upon palpation small tumours varying in size from a kernel of corn to a pea or bean—seldom are they larger—may be made out. The small tumours are of stony hardness; the larger ones may be soft and fluctuant. It seems on examination as if the palpating hand were grasping a pouch which was filled with shot and bullets. Often one has the impression that one could rub together the small tumours and displace them under the skin, a circumstance which increases the similarity between a breast so affected and a bag of bullets. The beginning of the pathological process is quite like the proliferative change found in the lactating breast.

The mechanism by which the activities of the ovaries, uterus and mammary glands are regulated, coordinated and synchronized, is fairly well understood and definitely known at present. The idea which formerly prevailed, that the changes which occurred in the breast during pregnancy were of nervous origin, has been pretty well disproven. Mironoff (1894) and Goltz and Ewald (1896) demonstrated conclusively that the changes occurring in the breasts during pregnancy still took place when all nervous connexions were interrupted. The development and growth of the mammary gland follow a more or less uniform course, and can be correlated with changes occurring in the ovary. As puberty

approaches, one of the most marked changes is that occurring in the breasts. Structural changes in the breast are correlated with a succession of œstrous cycles in the humans. In the rabbit and ferret, in which ovulation occurs only after coitus, the state of œstrum may continue over a long period.

Clinically, changes in the breast are frequently observed some time during the menstrual cycle; most frequently before menstruation begins. The woman complains of a sense of fullness of the breast and some tenderness. Upon palpation a granular, flattened mass, which disappears when menstruation begins, may be felt. Scarzoni and Gautier state that a serous, milk-like fluid may be discharged at such times.

Histological studies indicate a definite relationship between the breasts and the internal genitalia. Pieces of breast tissue removed at definite known times in the menstrual cycle have been sectioned and histological studies made. The principal changes have been found in the epithelium, but definite changes in the connective tissue have been noted. Geschickter and Lewis have examined 47 specimens removed from breasts which have been operated upon at definitely known periods of the menstrual cycle. Most of the operations were performed for fibro-adenomata and carcinomata. The criticism may be made that the tissue is not normal, but attempts were made to remove the tissue at some distance from the lesion. At the mid-period of the menstrual cycle the duct system was found to be expanded and an increase in the epithelium was noted. These changes coincide with the rise of concentration of œstrin in the blood. An increase of the acinar elements occurs from the twenty-sixth to the twenty-eighth and thirtieth days. The changes in the acini correspond to the rise in progestin concentration. The effect of progestin may be somewhat obscured by that of theelin. Menstruation is indicated and accompanied by round cell infiltration of the stroma in the lobule and desquamation of duct epithelium. Menstruation is followed by a short resting stage in which round cell infiltration disappears, the acini become reduced in size, the stroma becomes more compact, and the tubules lie close together. Rosenburg found that in the premenstrual phase numerous outgrowths developed from the ducts. These growths were at first solid, but later definite indications of lumina formation appeared. During this period a fresh or at least a functioning *corpus luteum* is found. At the end of this period degeneration occurs in the cells, which become less clearly defined and definitely outlined. Involution of the breast is occurring and the *corpus luteum* is, as a rule, hæmorrhagic and is not functioning actively. The regressive changes in the breast epithelium are still further advanced in the postmenstrual period. At this time the epithelial buds show marked regressive changes, are no longer easily distinguishable from the surrounding tissue, and the *corpus luteum* has become atresic. Rosenburg concluded from his studies that the *corpus luteum* of menstruation and pregnancy causes a physiological hypertrophy. If pregnancy does not occur, the outgrowths from the ducts occurring

during menstruation regress. If the *corpus luteum*, as in amenorrhœa, is not present, hypertrophy of the breast does not occur and outgrowths from the ducts are not formed. Definite changes in the breast during the menstrual cycle have been described by Polano, Dieckmann and Moszkowicz. Difference of opinion may be held as to the interpretation of these changes, but all agree that alteration in the breast correlated to different phases of the menstrual cycle does occur.

Observations which have extended over a number of years indicate that there is a definite relationship between the sex organs and the breast; for example, gynæcomastia. Enlargement of the male breast has been noted in hermaphrodites and in patients with imperfect development of the sex organs. Such observations have been recorded by Beau, Polaillon and others almost one hundred years ago. Such findings have been interpreted by some as supporting the theory advanced by Moszkowicz that testicular secretion inhibits the growth of the male breast. The relationship between chorio-epithelioma of the testicle and gynæcomastia has been especially emphasized by Kriss. More recently a number, among them Bailey, Cairns, Heidrich, Ferguson and Herzenberg, have directed attention to this relationship.

A case reported by Lilienthal illustrates in a striking way the relationship between gynæcomastia and chorio-epithelioma.

The patient, aged twenty-five years, was seen by Dr. Lilienthal on January 22, 1931. Six months before this the patient's breasts began to enlarge and became slightly tender. At the same time the patient developed a cough—at first dry, later accompanied by about one half-ounce of mucoid sputum a day. Gradually the sputum became darker and was occasionally streaked with bright blood. Once or twice a small amount of old, dark blood was seen. At his first visit the patient appeared to be exceptionally well developed, the only discoverable change being that which had taken place in the breasts. These were prominent and resembled those of a well developed mature woman. The areolæ were heavily pigmented. A small supernumerary right nipple was found. No nodules or irregularities were found in the breast and no axillary lymph nodes could be palpated. An X ray examination of the chest revealed a rather diffuse, wedge-shaped opacity, the apex being directed toward the periphery and the base resting in the mediastinum. The findings suggested a neoplasm. The chest was explored on January 30 and a node was removed. The tissue was examined by Dr. James Ewing, who made the following report: "A malignant tumour of a very peculiar structure. I am not sure of the exact origin, except that it is malignant. About some foci of hæmorrhage the cells are syncytial and this suggests chorioma. The tumour suggests to me a metastatic growth from the testis in which extremely small tumours sometimes give rise to metastases. Of course, the idea of testicular origin is a mere guess."

Some days after the operation Dr. Robert F. Frank reported on the urine as follows: "The Aschheim-Zondek test is as strongly positive as in pregnancy. I am only aware of this test having been performed on one case of chorio-epithelioma in the past. The positive test shows that chorio-epitheliomatous tissue biologically is similar to placental tissue in normal condition."

The obvious lesson which I learned from this case is that in the presence of mammary glands with female morphology in a male, with or without other general anatomical characteristics of a female type, a search should be carefully made for tumours of the testicle, abdomen, mediastinum and lungs, with the idea that we may be dealing with

chorio-epithelioma. It seems strange that in all the literature on this subject the instances are extremely rare in which careful examination of so obvious a part as the testicle has been made.

The changes occurring in the breast during menstruation, the association of gynæcomastia with chorio-epithelioma, and the enlargement of the breast occasionally seen in children when œstrin is administered in the treatment of gonorrhœal vaginitis, suggest that certain breast changes may be due to the action of ovarian hormones.

Most of the theories which have been advanced to explain the development of cystic disease of the breast have not been convincing. I shall refer to some of the observations which have been made and work done, but shall not quote extensively from the literature. Goormaghtigh and Amerlinck found that changes resembling those of a cystadenoma could be produced in the mammary glands of mice by the administration of œstrin, but these changes were dependent upon the presence of the ovaries or, in other words, of a *corpus luteum*. These authors also suggest the possibility of the production of carcinoma by œstrin injections. Such a possibility has been indicated by Lacassagne. Lacassagne directs attention to the fact that all strains of mice do not have a like susceptibility to the hormones, and that factors other than the hormones must be considered. Geschickter and Lewis have attempted to produce changes in the breasts of monkeys by administering ovarian extracts. Œstrin varying in amounts from 2,000 to 5,000 units has been used. E. R. Squibb and Sons have furnished us with material which bears the trade name of "Amniotin", the hormone being in solution in corn oil. Five thousand rat units were given a cebus monkey over a period of ten days. A total of 2,000 units was given the macacus monkeys in doses of sixteen to sixty-four units daily over a period of six weeks. The most positive results were obtained when small doses were given daily over longer periods. The changes were bilateral. The nipples and breasts increased in size. At the end of the experiment the nipples stood out almost two centimetres beyond the breast, and the breast measurement, taken from the base of the nipple to the axillary margin, was two and one-half centimetres.

These changes were noted in all the monkeys (two cebus and five macacus). Tissue for control purposes was removed from the breasts before the injections were made. Like changes were produced in the breasts of one monkey which had been castrated, castration having been performed to rule out the possibility of the action of testicular secretion. The changes tended to regress at the end of two weeks.

On microscopic examination the following changes were noted. The ducts had increased in length and were dilated, and the number of epithelial layers had increased. An increase in the amount of periductal connective tissue was also noted. When regression took place the epithelium and the periductal connective tissue were reduced in amount and resembled more closely the adult type. Regressive changes were hastened by castration. The changes resembled those of gynæcomastia. In four

male monkeys (one cebus and three macacus) in which one or both testicles were present, a condition resembling, but not identical with, gynæcomastia followed the injection of anterior pituitary-like hormone (chronic gonadotropic hormone) obtained from pregnancy urine. "Follutein" in powdered form was kindly furnished us by E. R. Squibb and Sons. It was dissolved in sterile water. The doses varied from 7,000 to 20,000 rat units. Moderate bilateral enlargement of the breasts was caused by this solution. Microscopically the changes were not so marked as those cited above. The epithelial and periductal changes were not so marked as in typical gynæcomastia. The testicles were enlarged, being about two and a half times as large as those of a cebus monkey normally are. Histologically a definite increase in the interstitial cells was noted. In one instance the prostate became so large that urinary retention occurred.

That there is a relationship between fibroadenomata and the physiological hypertrophy which occurs at puberty appears to be substantiated by the findings in 220 fibroadenomata observed in women who had not borne children. One hundred and forty-seven of these patients were under thirty years of age. Sixty-five patients were under twenty, and twelve under fifteen years of age when examined. The remainder averaged thirty-six years of age, and the average time that the tumour had been noted was between six and seven years. When the time that the tumour had been noted is subtracted and allowance is made for the time that must elapse before these slowly growing tumours become large enough to attract the patient's attention, it seems justifiable to conclude that the tumour usually begins to develop between the tenth and twentieth years. Rarely do fibroadenomata develop in the decade between thirty and forty; practically never after the menopause.

The data which have been presented seem to indicate that there is a definite physiological relationship between ovarian and breast functions. The thought is justified that these different hormones might be recovered from tumours and cysts, if such definite correlation exists between the two.

Some time ago I removed a large fibroadenoma from the left breast of a coloured girl, aged twelve years. She had not menstruated. The breast from which the tumour was removed was large for a girl of her size—probably a stage of virginal hypertrophy. The tissue of the tumour was assayed for us through the kindness of Dr. Morrell, of E. R. Squibb and Sons. The preliminary assay yielded more than five rat units of œstrin per gramme of tissue, or more than forty-five times as much œstrin per unit weight as is found in the normal sow's ovary, the richest natural source of this hormone.

In other words, this fibroadenoma, developing at puberty, yields in the neighbourhood of 2,500 units per pound of tumour tissue, whereas the sow's ovary yields only from 50 to 75 units per pound. Such findings seem to indicate that tumour tissue of the type under discussion can concentrate œstrin.

I shall mention briefly some other assays. The following case is that of a large fibroadenoma of the breast, positive for œstrin.

The patient, a white female, aged forty-five years, had noticed a swelling of the left breast for three years. No pain was noted, but tumours appeared in different parts of the breast. A sanguino-purulent discharge from the nipple was noted. There was no history of abscess of the breast or fissures of the nipple. No trauma had occurred. The thyreoid gland was not palpable. The Wassermann test yielded no reaction. The menstrual periods had been regular until the last few. The patient had been pregnant twice.

The bio-assay of this large fibroadenoma yielded approximately 200 rat units per kilogram of œstrin.

Mrs. R.C., white female, was aged forty-nine years. The diagnosis was cystic disease of the breast; fibromyomata of the uterus. An operation was performed on March 17, 1934. The cysts of the breast were removed, and a hysteromyomectomy, salpingo-oophorectomy and left posterocolporrhaphy were performed. Menstruation had begun at fourteen; spotting was at first noted, and this continued for seven months. The periods were irregular. Abortion occurred during the first pregnancy at two months. A curettement was performed. Severe bleedings followed, which lasted several months. Bleeding occurred during the second pregnancy for three months, but a normal child was born at term. During the past two years the periods had been irregular, and there had been considerable intramenstrual bleeding. The patient had two children (aged twenty and nineteen years). These children are living and well.

The bio-assay of the breast tumours yielded 1,000 rat units of œstrin per kilogram.

This patient is a white female, aged thirty-nine years. She is under weight. Four months before admission to the hospital she felt a stabbing pain in the left breast. Following this she discovered one mass, and then several. No discharge from the nipple was noted. The patient had recently lost weight. Menstruation had become irregular and scanty, the periods being about two weeks apart. Physical examination revealed a thin, nervous woman. Both breasts felt shotty. They were relatively small, and had a definite edge. The left breast contained three definite nodules, two of which transilluminated darkly. Smaller and rather indefinite nodules could be palpated in the right breast. An operation was performed on August 24, 1934. Both breasts were removed, but no axillary dissection was made. The pathological report stated that several small cysts were found in the right breast and minute papillomata and adenomata in the left.

A bio-assay of the left breast yielded both prolan and œstrin.

The patient, a white woman, aged fifty-one years, had a mass in the left breast. She had had three children; the oldest was twenty-six years old, the youngest eighteen. The uterus had been suspended one year after the birth of the last child and the vaginal outlet repaired. Menstruation began at fourteen and had been regular until shortly before admission to the hospital. On examination the right breast appeared to be normal. A firm nodular mass could be palpated in the left breast. This measured five by six centimetres. It was located in the upper and outward quadrant. The mass was freely movable and not adherent to the underlying structures. On September 27, 1934, the mass in the left breast was removed. On gross examination many cysts were found. Several of these were ruptured when the tissue was incised. They contained a cloudy, milk-like fluid. Pathologically a diagnosis of cystic mastitis was made. There was a definite increase in the stroma of the breast and periductal connective tissue.

The bio-assay of this tissue yielded as high as 13 rat units of œstrin per gramme.

BLOOD AND URINE ASSAYS IN GYNÆCOMASTIA AND VIRGINAL HYPERTROPHY.

Blood and urine assays have been made in the following cases of gynæcomastia and virginal hypertrophy.

Gynæcomastia Associated with Teratoma Testis: 40,000 mouse units, or 4,000 rat units of prolan *A*-like substance per litre of urine. The patient, a white male, aged thirty-two years, had noted a swelling of the testicle three months before. Recently an enlargement and fullness of the neck above the clavicle on the left side appeared. At the same time an enlargement of the nipples and fullness of both breasts were noted. The affected testicle was removed, and X ray exposures were given over the pelvic nodes and the supraclavicular region. Before X ray therapy was given the urine, when assayed, yielded 40,000 mouse units per litre of a prolan *A*-like substance. Following removal of the testicle and irradiation the assay yielded 12,000 units.

Gynæcomastia with Positive Assay of Blood for Œstrin: The patient, a white male, aged twenty-two years, had noticed during the past six weeks progressive enlargement of both breasts, the right breast being slightly larger than the left. The general examination revealed nothing abnormal. Forty cubic centimetres of blood were withdrawn by vena puncture, and assayed for œstrin by the method of Frank. The test was positive for 100 mouse units per litre of blood.

Infantile Hypertrophy of the Breast: Urine positive for a prolan *A*-like substance. The patient, a white female, aged two years, had begun to menstruate at the age of three months. Shortly afterwards both pubic and axillary hair appeared. The patient was brought to the hospital because an ovarian tumour was suspected by the family physician. At the time of examination the breasts appeared as large as those of a normally developed girl of thirteen or fourteen years. An exploratory laparotomy was performed. The left ovary was apparently normal in appearance. A cyst measuring about five centimetres in diameter was found in the right ovary. The cyst was excised and a biopsy was made of the opposite ovary. The cyst had a definite granulosa cell lining with layers of surrounding cells of the *theca lutein* type. The pathological diagnosis was *theca lutein* cyst.

There are certain clinical evidences that definite changes in the breast are associated with increased amounts of sex hormones in the blood and urine. The most striking illustration is that of gynæcomastia and its association with chorio-epitheliomata of the testicle, or primary chorio-epitheliomata in other portions of the body. The possibility of reproducing changes in the breast experimentally by injecting these hormones and recovering them by bio-assay in relatively large amounts from tumours of the breast suggests that alterations in quality or quantity of these hormones may have some causal relationship to their formation.

ON HARE-LIP.

By C. H. Fagge,
London.

Not the least of the elements of fascination which such an operation as that for the correction of the deformity of hare-lip exercises on those who attempt it, is an appreciation of its difficulties, of the problems which it presents, of the aims to be attained or at least to be attempted and kept in view, and, lastly, of the errors to be avoided. Now it may be a platitude to remark that one man's difficulties are not another's, as it is equally true that possibly no two given surgeons will attempt to attain a point in technique by the same method.

In my youth I read with interest and almost certainly with advantage a classic on operative surgery, written by one of my teachers, in which such difficulties and points in technique were elaborated. To my younger and probably more sanguine mind half the difficulties did not exist, and the points in technique therefore were unnecessarily detailed. Such a criticism may be brought against what is written below. The only answer which can be made to this is that the paper is an attempt to describe personal difficulties and the methods by which they have been overcome, or at least attempts which have been made to deal with them. Nor is any claim made for originality in such methods or attempts. A hare-lip operation is peculiarly of a type which one rarely does twice in exactly the same way: the surgeon introduces a small detail and six months later finds himself still using it. The next stage is to wonder why, and he concludes almost subconsciously that it is an improvement on his former technique. This leads him to ask when he first did it—a question very hard to answer, as hospital notes do not rise to such minutiæ unless the special point in technique is dictated by the operator. And more important still, it is most difficult to discover how and why a certain detail was introduced. A surgeon perhaps sees or reads that another surgeon makes use of the same method. Did he learn it from his colleague, or did the colleague learn it from him, or was it an obvious device by which anyone faced with the given difficulty would endeavour to overcome it?

So I can only beg the pardon of any from whom I have derived help (and they must be many) and whose help is not acknowledged, and of those to whom through ignorance on my part methods and precedence are not assigned. However keenly interested a surgeon may be in any one part of surgery, it is yet exceedingly difficult for him to acquire knowledge of all that is written or said on that particular subject. The main

intention of the surgeon dealing with a hare-lip is to fill in the gap—to bring the upper lip into a completely normal appearance and function—or at least to carry this out as far as possible.

It is not my purpose here to argue the question as to how far this is possible, a question which principally depends, so it seems to me, on the fundamental premise of the nature of the deformity.

Is the failure of the line segments of the upper lip to unite due to an actual loss of substance, or is it merely an inexplicable failure in the normal fusion of two or more perfectly normal processes in the embryo? For, clearly, if the former view is adopted, it must be admitted that a less perfect grade of anatomical and therefore functional normality is likely to be attained than if the second of the alternatives is regarded as correct. In restoring to normality the upper lip, distorted by a unilateral cleft, the first main requirement is that the body of the lip shall be normal in appearance, position and function. Nature, in joining up the fronto-nasal and maxillary processes of the embryo, attains the unattainable ideal of the reconstructive surgeon—a scarless union.

I am indebted to Dr. J. Beattie, Conservator of the Royal College of Surgeons, for the information that in the embryo normal union of these processes takes place at a period before there is any differentiation of the subepithelial tissues, that is, before any fibroblasts have been differentiated out of the subepithelial mesenchyme. Whether we may, in the future, devise a means of limiting or inhibiting temporarily the formation of fibroblasts at or near a healing wound in the skin and so of reducing the formation of scar tissue, is a question to which an answer may be provided by researches now being carried on in the Research Laboratories of the Royal College of Surgeons.

The appearance of a reconstructed lip will be much influenced by the amount, width, prominence and visibility of scar tissue.

Accurate suturing and primary union will do something to help, but a basal point in technique is the accurate bringing together of proper layers in the lip, a point of which I had not personally realized the importance, though, as a matter of fact, I had gradually modified my technique in a way comparable to that advocated by Veau (*Proceedings of the Royal Society of Medicine*, Volume xxi, 1928, page 1868).

The position of the upper lip relative to that of the lower is to my mind less under the control of the operator; it will be determined largely by the falling back of the maxillary process on the affected side, or perhaps by the failure of the premaxilla to attain its normal prominence.

I used to believe, as I was taught, that an underhung aspect was due to interference with the premaxilla either by its removal in a case of double hare-lip, or to its having been forcibly pushed backwards, or to paring of its prominent part, in a unilateral case. Though I have never done either of these things for perhaps twenty years, I think I have learnt that a variable, and in my judgement an uncontrollable, degree of "underhangness" may result when no bone plastic is attempted. I have found that a dental colleague can devise, possibly with the

assistance of an Esser's epithelial inlay, a complete correction of this deformity. The function of the normal lip depends upon its freedom and mobility; in the reconstructed lip the accuracy of apposition of its muscle layer and the freedom from adherence to the alveolus are the chief factors in insuring its normal function. I have not infrequently found, particularly after my earlier lip operations, that the newly restored lip was adherent along the line of suture and required freeing with the insertion of an Esser's epithelial inlay to restore and maintain the buccal sulcus.

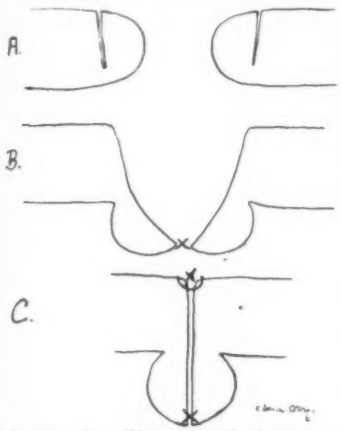

FIGURE I. Diagrammatical representation of incisions along margins of cleft. A, showing depth; B, flap turned back; C, showing position of same after sutures have been inserted.

To prevent this adhesion, I have, in making the vertical incisions along the margins of the cleft, cut only perhaps three-fourths of the way backward from the anterior margin, and turned back the mucous edge and sutured it in position with catgut.

These flaps are admittedly redundant and need free paring, but I think they help to reduce the chance of adhesion of the lip to the alveolus, and they certainly increase the thickness of the lip antero-posteriorly and so tend to lessen the "underhung" appearance.

I have always been an adherent to the view that hare-lip is associated with, if not due to, a defect of substance; so a reconstituted lip is stretched and has a taut appearance; this tends to make its vertical measurement gradually decrease, or at least not increase at the normal rate. If this occurs the lip will not occlude the buccal orifice and the teeth will show; it also tends to induce atrophy of the lip and an increase of the relative prominence of the lower lip.

The most obvious requirement in the hare-lip operation is a restoration of the normal mucous margin, a normal line of the muco-cutaneous junction and a normal tubercle in the centre of the upper lip.

I have in general been in the habit of following the technique of Mirault, in which the

FIGURE II. Single hare-lip, showing incisions following the technique of Mirault.

flap of mucosa that is to form the tubercle of the upper lip, is taken from the lateral margin of the cleft. Here it is important that the tubercle shall be exactly median, and that it shall be larger than will eventually be desired, for it tends to shrink. In carrying out this part of the operation, it is all important that the mucosa should be freely excised along the medial margin of the cleft down to a line which defines the junction of the mucosa and skin of the lateral parts of the lip; otherwise mucosa will be left at a higher line than normal above the repaired cleft. The normal line of skin and mucosa will be interrupted and the result will be unsightly. This unsightly effect can equally be produced by carrying the skin flap down so that it occupies an area which is below the normal muco-cutaneous line. The former defect is not uncommon, especially on the medial side of the repaired lip, owing to too sparing a removal of mucosa; the latter defect is much less common.

FIGURE III. Dotted line showing extent of separation of the cheek from the maxilla.

The nasal part of the operation, in my judgement, presents problems even more difficult of solution, and it is chiefly with the idea of obtaining criticism from others, and in the hope of obtaining a method for the satisfactory solution of one or two points in connexion with this part of the operation, that these views and principles of technique have been committed to paper. The most obvious defect is the splaying out of the ala. Many writers and operators have stressed this as a difficulty. I can only say of this, what I can say with little assurance of most of the difficulties of this operation, that it is a point with which I really believe I know how to deal.

The first step in the hare-lip operation is the separation of the cheek on the lateral side of the cleft, very widely and as high as the infraorbital foramen. For this purpose an incision is made along the buccal sulcus, and then with a blunt instrument the cheek is separated upwards from the maxilla. This separation is continued until the ala lateral to the cleft comes easily into position. It is prone to evert, and, to bring it well inwards, the mucosa passing from the ala on to the lateral wall of the nasal fossa will in a bad case need free incision.

If the lateral ala comes well into position, a normal or at least a passable naso-labial fold will have been formed. To relieve tension on the suture line, and to insure an exaggerated naso-labial fold, I have at times inserted a tension stitch of salmon gut across the base of the

nose (see Figure V). It is of the mattress type, passing at either end over a small roll of gauze or rubber. Veau (*loco supra citato*) attaches great importance to this stitch as a preventive to non-union. Admittedly, his views suffer from the disadvantage of being written in a foreign language, but even so I think this stitch cannot fulfil all he expects of it. In my own practice I must place little confidence in it, as I find that I use it only when the lateral ala does not come easily into position.

It will now be necessary to reconstitute the nostril which is too big and is placed too low when compared with its normal fellow.

The tip of the nose on the affected side shares the deformity of the nostril. At the muco-cutaneous junction on the medial side of the

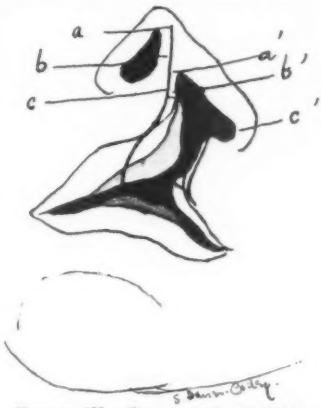

FIGURE IV. Showing the incision along the medial side of the affected nostril. This passes back through the mucosa covering the septum.

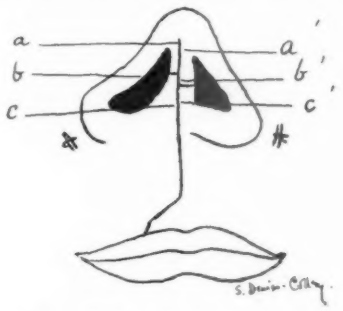

FIGURE V. Showing the pushing forward of the flap on the medial side of the nostril necessary to bring a', b' and c' parallel to a, b and c. The effect of this is to raise the point of the nose and the nostril to the same level as those on the normal side. This figure also shows the tension stitch at the base of the nose.

nostril an incision is made downwards into the cleft and upwards towards the tip of the nose, and the nasal mucosa is freely separated. A blunt hook inserted into the nostril will now pull it and that side of the tip of the nose forward, and the flap is sutured, so that any point on the lateral edge of the incision is higher than it was formerly. I have attempted to pull the nostril upwards by keeping a blunt hook fixed in the nostril for two or three weeks, mounted on a stand over the bridge of the nose, but this has not been a success. It may be necessary to cut away freely the edges of the cleft where they form the lower part of the circumference of the nostril, particularly on the lateral side. It must be borne in mind that the manœuvre for the correction of the tip of the nose will have used up a small piece of the medial margin of the nostril, so this rectification must be done before the edges of the nostril are resected. If the lower margin of the nostril is not removed, the nostril will be too wide, and the spreading out of the ala will remain incompletely corrected.

In most cases the sutures may now be inserted. Skin sutures are of fine gossamer gut, interrupted, beginning above at the margin of the nostril.

It will usually be found that the lateral margin of the nostril is no longer spread out, it comes snugly into contact with the medial edge; both are so trimmed down that the nostril is no larger than the other, but the *ala nasi* is often everted. The normal ala is inverted—concave internally; the ala restored may remain flat or even be convex. This is to me one of the insoluble problems of the operation. Most other writers do not mention it. Is it no trouble to them or have they not noticed it? I have excised triangles of skin from the inner surface of the ala, so formed with their base backwards as to invert the ala when their margins are sutured. I have excised flaps, and have sometimes included the cartilaginous basis of the ala. I have thought this manœuvre useful; some of the results have seemed improvements, but I cannot get it perfect. This eversion (not spreading out) of the ala and the defective prominence of the tip of the nose and the nostril on the affected side are for me the greatest difficulties in technique in an operation on a single hare-lip.

DOUBLE HARE-LIP.

In general principles the operation follows exactly the lines of that on a single cleft. As the defect is double, the deficiency of tissues is twice that of a single case, and so the reconstituted lip is tighter than after a single hare-lip operation. In my judgement this tight lip presses

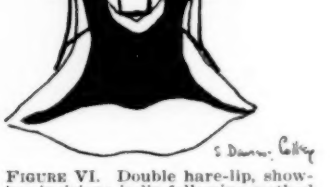

FIGURE VI. Double hare-lip, showing incisions in lip following method of Mirault and flap in skin covering premaxilla.

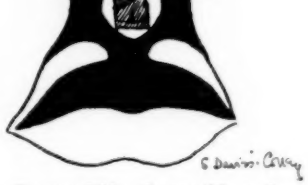

FIGURE VII. Premaxillary flap pushed upwards to cover columella.

back the premaxilla, and is an important factor in producing an underhung appearance, even when the premaxilla has not been interfered with at the operation.

In most double hare-lips the premaxilla, covered by a triangle of skin, is tilted forwards. I used to pare the edges of the cleft and suture the lateral edges to the pared margins of this triangle. The cosmetic effect was not good, for the lateral margins of the cleft had to be brought

together below the triangular premaxillary flap, while at the level of the nostril they were separated by its width.

Further, I noticed that after the operation the tip of the nose tended to become flattened as if the lip pulled it down, so I gave up including the premaxillary skin flap in the lip, making use of it to elongate the columella. This was done by making vertical incisions through the triagular flap, continuing upwards to the lateral margins of the columella.

These incisions reached almost to the posterior mucous covering of the flap; its lateral edges were turned backward; the medial strip was dissected free posteriorly well upwards on to the columella and sutured in position, the pared lateral margins of the cleft being brought together below it.

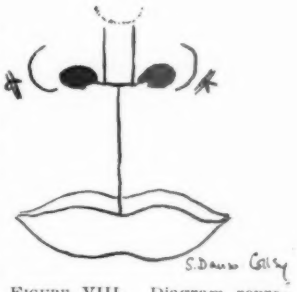

FIGURE VIII. Diagram representing finished operation, with tension stitch at base of nose.

As pointed out, such a lip tends to become thin and to drag upwards; the result is to produce a "fish mouth". This I have attempted to obviate by leaving the mucous flap turned down to form the tubercle redundant. In the reconstruction operation of double hare-lip the difficulties are increased in geometrical rather than in arithmetical proportions; so the surgeon must be satisfied with a result which would be regarded as poor after a single hare-lip operation.

THE TREATMENT OF INDIRECT INGUINAL HERNIA.

By HENRY SEARBY,
Surgeon to In-Patients, Royal Melbourne Hospital.

IN the inguinal region in the male there is a small triangular area bounded by the inguinal ligament, the lower curved margin of the internal oblique muscle and the deep epigastric vessels (Figure I). Coming from deep to the internal oblique and transverse muscles (which may well be called the conjoined muscle) and passing superficial to the vessels and, therefore, coming "through" the triangular space, is the spermatic cord (Figure II). In fœtal life the cord is accompanied by the *processus vaginalis* which usually atrophies before birth.

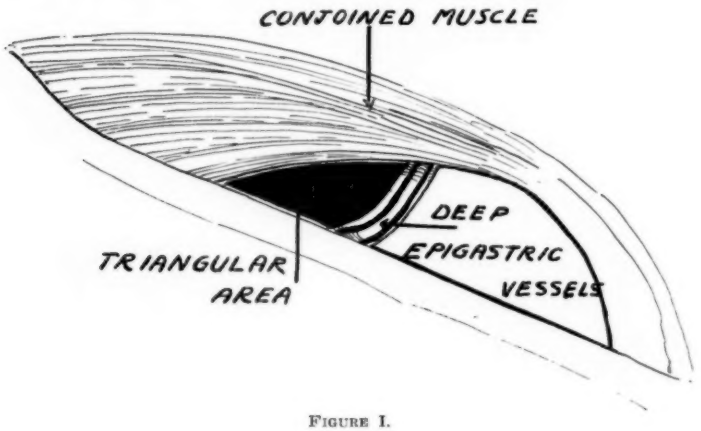

FIGURE I.

A diverticulum of the peritoneal cavity may occur in many situations. When any intraabdominal contents prolapse into such a diverticulum, a hernia is said to be present, and the diverticulum is called the "sac". When the sac of a hernia comes through the triangular space described above, the term "indirect inguinal hernia" or "oblique inguinal hernia" is applied.

A person affected with this type of hernia may seek surgical relief, which, for a variety of reasons, is advisable.

At operation, or in the dissecting room, when the contents of an ordinary recent indirect inguinal hernia have been reduced into the

main peritoneal cavity, the only abnormal anatomical feature is the peritoneal sac. The logical treatment, therefore, is to remove the sac and to take such steps as are considered necessary to prevent its reappearance in the same position. This, of course, presupposes a knowledge of the reason for the appearance of the sac in the first instance.

The late Mr. Hamilton Russell convinced many surgeons that the sac of an indirect inguinal hernia was a remnant of fœtal life. To cure such a hernia he removed the sac completely with a minimum of disturbance of the surrounding parts. This was logical according to his belief as to the origin of the sac.

Other surgeons either do not believe that the sac is a fœtal remnant, or, if they do, they consider that other factors are also at work. Only

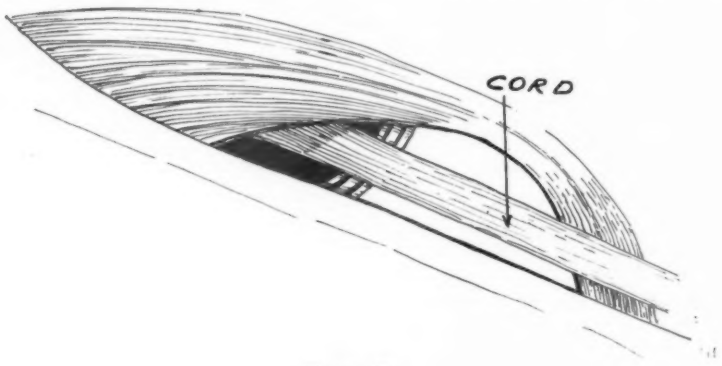

FIGURE II.

two such factors are invoked: (i) excessive intraabdominal pressure, (ii) weakness of the abdominal wall. In no type of operation for the cure of indirect inguinal hernia are any steps taken to reduce the intra-abdominal pressure. Indeed, as this is impossible, the attempt to prevent the sac reappearing consists of dealing with what is called a weakness of the abdominal wall. The essential feature of this procedure —known in hospital jargon as "a Bassini"—is to suture that part of the lower curved border of the conjoined muscle which is medial to the deep epigastric vessels to the inguinal ligament. (Such suturing cannot be done lateral to the vessels or the cord would be compressed.) In this way a normal cleavage area through which the sac did not originally appear, is closed. This procedure is illogical.

Practically all resident medical officers are allowed to operate for indirect inguinal hernia and some are taught to. It is regrettable that they are thus allowed to perform, or taught to perform, an operation which is not based on correct surgical principles.

The question of the origin of the sac in indirect inguinal hernia will probably never be settled to the satisfaction of all surgeons.

That a diverticulum of peritoneum accompanies the testis in its descent during fœtal life is incontrovertible; that the sac of an indirect inguinal hernia in a new-born infant is a remnant of this diverticulum is almost as certain; that many adults, never before the subject of hernia, acquire indirect inguinal herniæ, the sacs of which reach to the scrotum from the moment of production, is evidence that, sometimes, at least, indirect inguinal hernia occurs into a preformed sac.

In infants the triangular area previously described is directly dorsal to the gap in the external oblique aponeurosis, known as the external ring. Practically all surgeons treat indirect inguinal hernia in infants by removing the sac, and are content to allow the musculature of this region to develop into its adult condition. They do not expect the children so treated to develop indirect inguinal hernia later in life.

In adults, operation for indirect inguinal hernia may well be performed under local anæsthesia. If the sac of a recently acquired hernia of this type is freed and the patient is asked to cough or otherwise to increase the intraabdominal pressure, bowel enters the sac, but there is no bulging of the abdominal wall medial to the neck of the sac. Actually the shutter-like action of the muscles is produced, and the lower curved border of the conjoined muscle moves downward toward Poupart's ligament. If the sac is then pulled out, twisted, crushed, transfixed and cut off so that the stump retracts beyond the triangular area, any amount of coughing or straining on the part of the patient fails to produce any bulging. If the small opening which has been made in the tissues superficial to the sac is then closed, the anatomy is restored to normal. Russell[1] showed that by treating the neck of the sac in this way a projection towards the peritoneal cavity was produced where previously a diverticulum existed. Keith[2] has pointed out that this procedure does more than remove the sac—it renders "the sphincteric mechanism of the inguinal canal again competent". With the patient's permission the author has exposed, under local anæsthesia, the opposite inguinal region when operating for unilateral indirect inguinal hernia. No difference in the shutter-like, or sphincteric, action of the muscles on either side could be observed once the sac on the affected side was removed.

If a surgeon believes that, in adults with recently acquired indirect inguinal hernia, there is a muscular weakness which has allowed bowel to enter the sac, his efforts should be directed to eliminating this weakness at the spot where the bowel emerged, that is, in the triangular area described. Supposing, further, that the lower curved margin of the conjoined muscle can be made to adhere permanently to the inguinal ligament immediately medial to the origin of this conjoined muscle, complete elimination of the supposed weakness is not achieved if the

spermatic cord is left *in situ*. To suture the more medial part of the conjoined muscle (and conjoined tendon) to the inguinal ligament is to attempt to close a normal cleavage plane through which the indirect inguinal hernia did not appear.

There is abundant evidence, however, that in many cases the permanent union of these tissues is not secured. Gallie and Le Mesurier[3] state, on excellent evidence, that it is very problematical whether the structures thus sewn to Poupart's ligament stay in this position for any length of time. The author has operated on five occasions, under local anæsthesia, on patients in whom a direct inguinal hernia (that is, a hernia the sac of which emerges medial to the deep epigastric vessels) has occurred soon after an operation of the Bassini type for indirect inguinal hernia. In all, the sutured portion of the conjoined muscle (and tendon, if it, too, had been sewn) had retracted upwards again. In one patient, a muscular man, silk ligatures had been used; they were still present in Poupart's ligament, but the muscle had retracted to a higher level than usual. These patients were asked to cough after the redundant peritoneum, constituting the wide-necked sac, had been removed. The shutter-like or sphincteric action of the muscles was insufficient to close the cleavage area and a bulging occurred. The only feasible explanation was that the fibres included in the ligatures at the previous operation had been strangled, the muscle had retracted and was insufficient to function in the normal manner.

If such suturing does result, in any individual instance, in a permanent apposition of the conjoined muscle and tendon to the inguinal ligament, the shutter action is destroyed and the conjoined muscle is stretched and therefore weaker than previously.

No statistics as to "recurrence" are submitted because in most of the publications on this aspect of hernia insufficient care has been taken to record the exact type to which both the original hernia and the "recurrence" belonged. Lack of appreciation, at operation, of the difference between indirect and direct hernia and errors of surgical technique will account for most of the "recurrences". Inefficient removal of the sac of an indirect inguinal hernia is probably the most potent cause of true recurrence, no matter how reluctant we may be to admit it. But many so-called recurrences are of the same type as the five cases mentioned above, that is, the direct type due to muscular weakness, and there is little doubt that this muscular weakness is often the result of the previous operation. There is no *post mortem* evidence known to the author proving that the Bassini type of suturing results in permanent union of the conjoined muscle (or tendon) to Poupart's ligament. There is, however, some evidence to the contrary. The author has watched many people perform operations of the Bassini type with all its variations and has never seen the triangular area, described at the beginning of this paper, touched. It is a very small area, and the cord occupies a large part of it.

CONCLUSIONS.

1. In infants, removal of the sac of an indirect inguinal hernia is the common and logical practice. The development of the normal adult anatomy can be confidently expected.

2. In recently acquired indirect inguinal hernia in boys and adults, removal of the sac allows the sphincteric action of the inguinal musculature to function normally. The suturing of the conjoined muscle and tendon to Poupart's ligament is followed either by a stretching and weakening of the muscle (if permanent union is obtained) or by retraction of the muscle and tendon again (if union is not obtained). If an excessive amount of the muscle has not been destroyed by the sutures, the sphincteric action of this region is still competent. In other words, many cases of recently acquired indirect hernia are cured despite the Bassini type of suturing. But it is possible to destroy so much muscle by this method of suturing that a direct hernia results.

3. In adults with very large indirect inguinal herniæ, with herniæ of long standing, and in elderly people with inefficient abdominal muscles, removal of the sac should be supplemented by some procedure designed to remedy this inefficiency which has resulted possibly from pressure in the first two instances and probably as a result of age in the third. It is not within the scope of this paper to describe the various technical procedures directed to this end, but the two methods which are logical and practical are, first, the covering of the region between the curved border of the conjoined muscle (and tendon) and Poupart's ligament with living sutures rather than the suture of this muscle to the ligament under tension, and, secondly, transplantation of the cord, overlapping the external oblique aponeurosis and closure of the external ring.

ACKNOWLEDGEMENT.

The author is indebted to Professor F. Wood Jones for the drawings in Figures I and II.

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TWO GREAT FRENCH SURGEONS: GUY DE CHAULIAC AND AMBROISE PARÉ.[1]

By L. COWLISHAW,
Lindfield, New South Wales.

I PROPOSE this afternoon to tell you the stories of the lives of two famous French surgeons, Guy de Chauliac and Ambroise Paré.

Guy de Chauliac lived in the early years of the fourteenth century, a period when the gloom of the Middle Ages was just beginning to lighten. The long struggle between Christendom and Islam was over. Feudalism was on the wane. The fourteenth century introduced a more modern period into both social and intellectual life. Commerce, business and manufactures, as well as the higher arts, took on fresh life. Increased prosperity favoured intellectual mobility and mental effort. The remarkable invention of gunpowder by Bernard Schwarz in 1330, if of doubtful benefit to suffering humanity, revolutionized the surgical art, and for the next two hundred years a controversy raged as to whether gunshot wounds were poisoned or not.

Ambroise Paré, who did so much to raise the status of the barber-surgeon, lived in that period of intellectual activity, the sixteenth century, known as the Renaissance, of which Matthew Arnold says:

> Thundering and bursting,
> In torrents, in waves—
> Scattering the past about,
> Comes the new age.

Before passing on to tell you briefly the story of the lifework of Guy de Chauliac, let us remember the names of some of the contemporaries of our surgeon who was in his prime just six hundred years ago. The Great Italian poet, Dante, was still alive when Guy de Chauliac was a young man. Dante died in 1321. Our English poet, Chaucer, was born in 1328, and wrote his stories of the Canterbury pilgrims during Guy de Chauliac's lifetime. John Wyckliffe's translation of the Bible is contemporary with Guy's "*Chirurgia Magna*". Boccaccio, the author of "The Decameron", which, apart from its immodest stories, gives a most vivid account of the plague, was also a contemporary. In England the first three Edwards ruled and made war on France, and had as their physician John of Gaddesden, well known to us as Chaucer's "Doctor of Physick", and as their surgeon John of Arderne, whose work on *fistula in ano* left little for the modern surgeon to improve upon.

[1] Read at a meeting of the Royal Australasian College of Surgeons, Melbourne, September, 1935.

Paré's name and fame are no doubt well known to you all, but the name of Guy de Chauliac has been forgotten, and is now known only to those strange medical men who like to delve in the records of the past. In his case, to quote the words of Sir Thomas Browne, "the iniquity of oblivion has blindly scattered her poppy". Does not the author of the first scientific textbook on surgery, which passed through innumerable editions in four hundred years, whose life is an example to every surgeon since, and whose ethical teachings have not been excelled by any medical man since the days of Hippocrates, deserve to be remembered with honour even in these days of modern scientific progress?

Unfortunately we have few details of the life of our mediaeval colleague. He was born in the last years of the thirteenth century in the little village of Chauliac, which lies in the mountains of Gevaudan, in the diocese of Mende on the frontier of Auvergne. His early education took place in the cathedral school, and from this school he passed to the University of Montpellier, where he began his medical studies. Montpellier in the early years of the fourteenth century was the leading medical school in Europe. From the twelfth century it had enjoyed this distinction, and John of Salisbury, Bishop of Chartres, assures us that in his day all medical students made a pilgrimage to Montpellier and Salerno. Saint Bernard, Abbot of Citeaux, in a letter dated 1153, tells us of an archbishop, who, falling ill on the journey to Rome, turned aside and visited Montpellier, was cured, and after the cure dismissed all his physicians and enjoyed good health for the remainder of his days. The School of Montpellier soon eclipsed its rival at Salerno, but a new rival arose in the University of Paris, which, for a brief period under Lanfranc, was the great surgical centre. Gradually more and more students and patients flocked to Montpellier. The university was fortunate in possessing the finest medical library of the time and here, as nowhere else, were to be found manuscripts of the Greek and Arabian authors. Guy made good use of his opportunities, and apparently was master of both Greek and Arabic, as we find in his textbook published thirty years later numerous quotations from medical writers, some of whose works are unknown to us.

After a few years Guy found that while the medical teaching at Montpellier was excellent, the opportunities of learning practical surgery were few and far between, and so our student started out on his *Wanderjahre*.

In this, as in later centuries, it was the custom for the student to travel from town to town seeking knowledge at the classes of famous teachers, and these journeys were full of dangers owing to the unsettled conditions in the countries traversed. Plague and other epidemics were always present, and the countryside was infested by roving bands of robbers.

The School of Bologna had enjoyed since the twelfth century a great celebrity. In this school anatomy was taught, not, as in Montpellier, by diagrams and drawings, which the professor, seated at his desk, described from a book, but by actual dissection of the human

body. Here in this Italian town from the year 1315 Mondino da Luzzi had dissected and demonstrated in public the parts of two bodies each year. Guy attended the demonstrations given by Nicholas Bertruccio, who had succeeded Mondino, and he tells us how the master, "having placed the body on a bench, gave four demonstrations thereon; the first day, he described the nutritive parts (that is, the viscera), because these soon decomposed. The second, the spiritual parts (brain and spinal cord). On the third day, the animate parts (the lungs and heart), and on the fourth day, the extremities." The textbook of anatomy written by Mondino da Luzzi remained the dissector's manual up to the sixteenth century. Our surgeon's attitude towards anatomy and dissection may be judged from his famous saying that "the surgeon ignorant of anatomy carves the human body as a blind man carves wood".

Having completed his anatomical and surgical studies at Bologna, Guy travelled on to Paris, a school which has been rendered famous by the work of Lanfranc and Henri de Mondeville. We do not know how long a period Guy spent in Paris, for we next hear of him practising at Lyons, and then returning to Montpellier to take his doctor's degree. He is said to have both practised and taught in his university town, but this is uncertain.

At last, his student wanderings finished, we find him settled in Avignon. At the beginning of the thirteenth century the papacy, driven from Rome, had established itself under Pope Clement V at Avignon, and in this city Guy served as personal physician to three popes: Clement VI, Innocent VI and Urban V, who returned to Rome in 1367. Guy remained behind to write his book on surgery, which, as he himself said, was to be the solace of his age. At this time he was sixty-three years of age, and from then on he fades into the mists of time, as we do not know when or where he took his rest.

Before passing on to speak to you about our second surgeon, it may be permitted to mention some episodes in the life of Guy which have been handed down to us. In 1348, while he was in attendance on Clement, the black death descended upon Avignon. The black death, which caused the extraordinary mortality of one-fourth of the population of the earth (over sixty million of human beings, Garrison tells us), appeared in Europe in 1348, after devastating Asia and Africa. For seven months consternation and death reigned in Avignon. Let us hear what our surgeon has to say about it:

> It was of two kinds. The first lasted two months, with constant fever and blood-spitting, and of this people died in three days. The second lasted for the rest of the time. In this, together with constant fever, there were external carbuncles, or buboes, under the arm or in the groin, and the disease ran its course in five days.
>
> The contagion was so great (especially when there was blood-spitting) that not only by remaining (with the sick) but even by looking (at them) people seemed to take it: so much so, that many died without any to serve them, and were buried without priests to pray over their graves.
>
> A father did not visit his son, nor the son his father. Charity was dead. The mortality was so great that it left hardly a fourth of the population. Even

the doctors did not dare to visit the sick from fear of infection, and when they did visit them they attempted nothing to heal them, and thus almost all those who were taken ill died, except towards the end of the epidemic, when some recovered.

The majority of the physicians of Avignon fled. Guy stayed at his post, not without fear, he tells us:

As for me, to avoid infamy, I did not dare to absent myself, but still I was in continual fear.

Towards the end of the sickness, Guy caught the infection, and was in great danger for six weeks, but in the end recovered.

Guy de Chauliac had his enemies. In the past, two men have been notorious for their hatred of the medical profession. They are Cato and Pliny. Pliny accused the physicians of his time of having largely contributed to the destruction of the Roman Republic. To them we can add the Italian poet, Petrarch, who pursued Guy with a most malevolent hate. "The edentulous old man from the mountains" was one of his kindest epithets. Whenever Guy went through the streets of Avignon in the retinue of the Pope, Petrarch stood by the roadside and recited scurrilous verses against the surgeon. The exact cause of all this enmity is unknown, but Laura, the wife of a young patrician of Avignon, died during the epidemic of the black death and our surgeon was her medical attendant. Now Petrarch was enamoured of Laura, and it is assumed that on her deathbed she confessed her amour to Guy, who was in holy orders.

Guy makes contact for a moment with English history. You will remember the tragic story of the blind King John of Bohemia, who, realizing at the battle of Crecy that the day was lost, ordered his squires to lead him into the thick of the battle, and there died fighting bravely. Now some time previously he had consulted Guy and asked him to operate on his cataract, but Guy considered that his case was inoperable, and merely gave him advice and put him on a diet.

Of Guy's book I do not propose to say much. It was the first attempt to describe logically and clearly all that was known about surgery up to that time. It is confessedly a compilation. He has taken the good wherever he has found it, though he adds that "my work also contains whatever my own measure of intelligence enabled me to find useful". He was the first to take the operations for hernia and cataract out of the hands of strolling mountebanks. He believed in operating on cancers in the early stages. His treatment of fractures has quite a modern touch, in that he advises suspension in slings, and in fractures of the thigh the use of weights and pulleys. He gives a glimpse of the early attempts at anæsthesia in his description of narcotic and soporific inhalations. It may appeal to those of you who like to know the origin of simple things, to be told that we owe to Guy the fashion in hospitals of a chain and handbar hanging over the patient's bed, whereby he can raise or turn himself easily, as well as the simple method of stiffening bandages with white of egg.

Unfortunately Guy was a reactionary in the treatment of wounds, and was deaf to the teaching of his great predecessor, Henri de Mondeville, who taught the doctrine of avoiding suppuration by surgical cleanliness. Guy favoured all sorts of salves, plasters and ointments in the dressing of wounds.

But it is by his noble example, his high ethical standard, that he is most to be remembered. One of the axioms of Henri de Mondeville was:

> Never dine with a patient who is in your debt, but get your dinner at an inn, otherwise he will deduct his hospitality from your fee.

How different from this cynicism is Guy's description of the ideal surgeon:

> The surgeon should be learned, skilled, ingenious, and of good morals. Be bold in things that are sure, cautious in danger; avoid evil cures and practices; be gracious to the sick and obliging to his colleagues, wise in his predictions. Be chaste, sober, pitiful and merciful; not covetous nor extortionate of money; but let the recompense be moderate, according to the work, the means of the sick, the character of the issue or event, and its dignity.

Now let us leave behind the sunny south of France and travel north to the city of Paris. Almost two hundred years have passed since we bade farewell to our mediaeval colleague, Guy, and we are in the century of the Renaissance. Here we find working at his profession one of the greatest surgeons of all time.

To me the figure of Ambroise Paré is that of a giant. Great in every way. Great in his surgical achievements, great in the nobility of his character, great in his influence on his time, great in his courage—but greatest perhaps in his humanity and charity. Has not his cry rung down the centuries: "*Je le pansay, Dieu le guarit!*" ("I dressed him, God healed him!")? What more can any modern surgeon say?

I do not propose to give a detailed account of Paré's long life, but to give in his own words as far as possible an account of certain outstanding events.

Born in 1510 in the little village of Bourg-Hersent, now part of the town of Laval in Maine, Paré was the son of a *coffretier*, a maker of chests. His education appears to have been rudimentary, for he himself says:

> I desire not to arrogate to myself that I have read Galen either in Greek or in Latin, for it did not please God to be so gracious to my youth that it should be instructed either in the one tongue or in the other.

Ambroise was apprenticed to a barber-surgeon, whose identity is unknown. The life of an apprentice in those days was a hard one if we are to believe a contemporary account.

> The cock has scarce done crowing when the apprentice must rise to sweep and throw open the shop, lest he lose the least payment that the tricks of the trade may bring him—some early beard to be shaved. He must comb the wigs, hang about the parlour or the staircase selling his stock, put folks' hair in curl papers, cut it or singe it. . . . Never did anyone ask so much of servant, never in the Islands did a white man seek so greedily to get profit out of a black one, as a master barber-surgeon tries to make gain out of the bread and water he gives his apprentices.

So hard at work were these apprentices kept, that "out of kindness" the professors gave their lectures to them at four o'clock in the morning.

Surviving this strenuous apprenticeship, Paré obtained a position as house surgeon at the Hôtel-Dieu, and there he spent three happy years.

For the next thirty years, D'Arcy Power tells us, Paré led a double life—with the army in times of war, at Paris in the intervals of peace. This life he led until 1569, when he settled in Paris, until the end of his days in 1590. Let us hear him tell of some of his war experiences. In 1536, in his twentieth year, Paré went as surgeon of infantry with the expedition to Turin. In the first engagement a Captain le Rat was wounded.

> He received an arquebus-shot in his right ankle, and fell to the ground at once, and then said: "Now they have got the Rat". I dressed him and God healed him.

He goes on to tell us how he came to abandon the use of boiling oil in the treatment of wounds.

> Now I was at this time a fresh-water soldier; I had not yet seen wounds made by gunshot at the first dressing. It is true I had read in John of Vigo, first book, of Wounds in General, eighth chapter, that wounds made by firearms partake of venenosity, by reason of the powder; and for their cure he bids you cauterise them with oil of elders scalding hot, mixed with a little treacle. And to make no mistake, before I would use the said oil, knowing this was to bring great pain to the patient, I asked first before I applied it. What the other surgeons did for the first dressing; which was to put the said oil, boiling well, into the wounds, with tents and setons; wherefore I took courage to do as they said. At last my oil ran short, and I was forced instead thereof to apply a digestive made of the yolks of eggs, oil of roses, and turpentine. In the night I could not sleep in quiet fearing some default in not cauterising, that I should find the wounded to whom I had not used the said oil dead from the poison of their wounds; which made me rise very early to visit them, where beyond my expectation I found those to whom I had applied my digestive medicament had but little pain, and their wounds without inflammation or swelling, having rested fairly well that night; the others, to whom the boiling oil was used, I found feverish, with great pain and swelling bout the edges of their wounds. Then I resolved never more to burn thus cruelly poor men with gunshot wounds.

This humane treatment of gunshot wounds and the revival of the use of the ligature were Paré's greatest claims to fame. At first Paré used the ligature only to tie vessels in severe wounds, but decided to abandon the use of the cautery in cases of amputation and ligature the bleeding vessels. We read that at the siege of Danvilliers in 1552:

> There was a culverin shot which hit a gentleman's leg; which I was faine to finish the cutting off, the which was done without applying hot irons. The Campe being broken up, I returned to Paris with my Gentleman whose Leg I had cut off. I drest him and God cured him; I sent him to his house merry with a wooden Leg, and he was content, saying that he scaped with a good cheape, not to have been miserably burnt.

To Paré we owe the reintroduction of podalic version in obstetrics; the invention of improved forms of surgical instruments; the distinction

between fractures of the neck and shaft of the thigh. He introduced massage, artificial limbs, artificial eyes, and made in 1536 the first exarticulation of the elbow joint. His influence with the soldiers is shown in the story of the siege of Metz. Things were going badly with the French troops shut up in the town.

> The King wrote to M. the Marshal de Saint Andre to find means to get me into Metz, whatever way was possible.

Arriving before the beleaguered city, Paré tells us:

> To speak truth, I could well and gladly have wished myself back in Paris, for the great danger I foresaw. God guided our business so well, that we entered the town at midnight. I went to M. Guise and gave him my message, and he ordered me a good lodging and said I must not fail next morning to be upon the breach. Which I did, and they received me with great joy, and did me the honour to embrace me, and tell me I was welcome; adding they would no more be afraid of dying, if they should happen to be wounded.

The besieged regained their courage and fought with renewed vigour, so that ultimately the Spaniards raised the siege.

Paré's influence with those in authority is shown by the fact that he rose from the lowest rank of his profession to be councillor of State and surgeon to four kings of France. It is said that it was through his influence over Charles IX that a stop was put to the progress of the massacre of Saint Bartholomew on August 24, 1572, when seventy thousand Huguenots were butchered in Paris and other parts of France. The old story that Paré was hidden in a closet to protect him from the fate of the other Huguenots is without foundation. He depended for safety on the promise of the king never to interfere with his religion.

It would be possible to go on for hours quoting good stories, but to paraphrase the words of Hippocrates, speeches can be too long and the time is fleeting, so I will close with the last episode we know of Paré.

Things in France had gone from bad to worse; the long struggle between King Henry III and the Guises had come to open warfare in the streets of Paris in May, 1588. In August of the same year the Spanish Armada had been defeated. In December, Guise and his brother were murdered by order of the king. In January of the next year the Queen Mother, Catherine de Medici, died, and there followed in a few months the assassination of the king. This left Henry of Navarre as king, and he marched upon Paris and besieged it, and then began a time of horror and starvation for the unfortunate citizens. We are told that "when the food gave out, they ate offal, the refuse in the gutters, the bones of the dead; even, it is said, the bodies of children". One day in the streets of Paris, Paré met the Archbishop of Lyons, who was the unrelenting enemy of Navarre. The grave old surgeon spake up loudly:

> Monseigneur, these poor people whom you see here about you are dying of the cruel rage of hunger, and demand pity of you. For God's sake, monsieur, give it to them, if you would have God countenance you.

The archbishop listened quietly, and afterwards said "that this was a different sort of politics than his own, but that Paré had awakened him and made him think of many things".

John Ruskin has somewhere said that "gentlemanliness is only another word for intense humanity". I think you will agree, if Ruskin's saying is true, that Ambroise Paré was a very great gentleman.

Let me conclude with a quotation from the "Memoirs of Pierre L'Estoile":

> Thursday, twentieth of December, 1590, the eve of Saint Thomas, died at Paris, in his own house, Master Ambroise Paré, surgeon to the king, aged eighty years, a learned man and the chief of his art; who, in spite of the times, had always talked and talked freely for peace and for the good of the people, that which made him as much loved by the good as he was wished evil and hated by the wicked.

A METHOD OF APPROACH TO THE TRIGEMINAL TRUNK IN THE POSTERIOR FOSSA DESIGNED PRIMARILY FOR OPHTHALMIC DIVISION INVOLVEMENT IN TIC DOULOUREUX.

By W. MAXWELL,
Sydney.

THE object of this description is to outline a method of approach to the trigeminal trunk suited especially to those inveterate cases of *tic douloureux* involving its first or ophthalmic division, either primarily or, as is more common, as a so-called "overflow".

According to Frazier's statistics as quoted by Stookey,[1] the ophthalmic division is affected in less than 5% of cases. A recent report of Horrox and Poppen[2] on a series of 468 cases of trigeminal neuralgia treated in various ways is impressive. The senior author explains the large number in the series by the fact that since 1925 Harvey Cushing has referred to him for treatment practically all his cases of this condition. In this series the first or ophthalmic division was involved in 2·9%, the first and the second or maxillary divisions combined in 3·8%, and all three divisions, ophthalmic, maxillary and mandibular, in 4·7% of the total cases.

For all cases of *tic douloureux* requiring operation the ruling passion among neurosurgeons appears to be either "subtotal" section of the trigeminal nerve trunk (Frazier), in which the motor root is generally saved as well as most of the ophthalmic fibres, or the somewhat similar "selective differential" section of the dorsal root (Stookey).[3] Dandy's operation of partial division of the nerve root at the pons appears more dangerous than any operation done by the more usual subtemporal approach.

Stookey claims[4] that though there is no definite separation into bundle groups in the dorsal root, there is a more or less definite anatomical arrangement: inner, middle and outer groups corresponding to the first, second and third divisions respectively. In cross section some overlapping of fibres occurs, but he advocates dividing only those sections derived from the second and third divisions. In doing this, he believes that the ophthalmic division is involved even more rarely than has been supposed, and that pain in the distribution of this division is not primary, but an overflow from the second division, as is shown when pain in the first division is relieved by alcohol injection into the second division. When this again becomes ineffective, he divides the

sections of the dorsal root corresponding to the second and third divisions. He has done this in four cases, with no recurrence within three or four years.

I know from a case of my own, and to which I shall refer, that this time period is probably inadequate in arriving at any conclusion.

As Stookey has operated upon only four cases of ophthalmic division involvement, I am emboldened to put forward this case as being comparable to them.

> Five years ago my patient had first and second division involvement, the ophthalmic involvement being confined to the supraorbital branches. Another surgeon divided the supraorbital and infraorbital nerves, but pain persisted in the alveolar and palatine branches of the second division. I severed the second division at the *foramen rotundum*, pushed the distal segment out through the foramen and plugged the latter with wax. Relief of the patient's second division pain is still complete, but for the last month he has had violent ophthalmic pain.

The pain has occurred five years following section of the second division, and the latter is still effectively silenced. It is not an "overflow".

Stookey, however, states that he recognizes that the procedure of saving the first division, even when the pain is presumably in this division, is perhaps as yet not widely founded, and that it seems advisable to test its ultimate value and usefulness. I take it that he regards the case as being still *sub judice*, but with a strong preliminary bias on his part. He says,[5] and I do not think it would be fair to comment unduly on it, that when the sensory fibres of the eye are cut the eye should be protected. He gives no actual evidence of this necessity arising in any of his cases.

Stookey describes his operation as follows: The line of cleavage between the dura and the *dura propria* of the ganglion is sought over the junction of the mandibular division and the Gasserian ganglion. By blunt dissection this line is followed backwards so as to expose the ganglion and the dorsal root at its opening through the tentorium.[6] An incision is then made in the dural covering of the dorsal root *et cetera*.

Horrox and Poppen[7] report that keratitis developed in 5% of those of their patients in whom complete root avulsion was practised, and that whenever the first division has been included in the root resection the need for most meticulous post-operative care of the eye cannot be too greatly emphasized.

Apparently by them the first division is intentionally severed. They say that the sensory root operation has been performed by them on 176 patients during the past ten years.

> The technique used in the sensory root avulsion . . . . is the same as that used by practically all neurosurgeons. . . . The complications were minor, with the exception of the rare development of keratitis in approximately 5% of those in whom complete sensory root avulsion was practised.

My own feeling is that the radical treatment of neuralgia affecting the second and third divisions, when such becomes necessary, gives satisfactory results. In my few cases, division of the second and/or third divisions at the *foramen rotundum* and *foramen ovale* with packing of

the individual cut end through the corresponding foramen and the plugging of the latter with wax has sufficed. Partial section of the ganglion root, as championed by Frazier and Stookey, gives the same result. But in those less frequent, but more terrible, cases in which the neuralgia affects the distribution of the first or ophthalmic division, whether the condition is an "overflow" or not, a situation presents itself which calls for much thought.

This position I shall deal with only briefly. Something of the various courses which may be followed has already been indicated. It is my present object to describe more a procedure than the necessity for its adoption. There will obviously be disagreement as to the latter.

With the ophthalmic division affected, the need for attacking the parent trigeminal trunk will be apparent. It is the only reasonable procedure because nowhere else may the first division be destroyed; and the maxillary division at least, and at times the mandibular also, are as a rule simultaneously affected, and must also be dealt with. Gasserian ganglion removal has long been discarded. But one may refer here to Trotter's patient in whom, following complete removal of the ganglion, the pain recurred after eleven years. This case is both a tribute to the inveteracy of the disease and to the necessity of allowing more than a few years to elapse before assessing the merits of any particular procedure. Of course, as the ophthalmic division, from the point of its emergence from the ganglion to its exit from the cranial cavity, lies within the wall of the cavernous sinus, it is individually secure from surgical assault, even if it alone happens to be affected.

It remains then to approach the trigeminal trunk (dorsal root) at some point proximal to the ganglion. Wilfred Trotter writes:[8]

> The only operation designed to interrupt the whole nerve that should be done is division of the sensory root between the ganglion and the pons.

Rowlands and Turner[9] supply a description of how this is to be done:

> The ganglion is exposed in the manner already described (Hartley-Krause method). The *foramen spinosum* is plugged, the middle meningeal artery divided, and the *foramen ovale* defined. The edge of dura running upwards and backwards from this foramen is incised and the root of the ganglion exposed. When the full breadth of the root has been cleared and defined, a hook is passed around it and it is drawn from its pontine attachment.

The text goes on:

> This operation is less troublesome than the old ganglion operation, and it is equally radical. It has of course the disadvantage of anæsthetising the cornea and of paralysing the muscles of mastication. Attempts to spare the motor root usually fail, and may lead the surgeon to spare some of the sensory fibres.

THE OPERATION.

Owing to ophthalmic involvement in the first of my patients I set out to do a sensory root operation along lines already described. The dural capsule in this case was not defined from the parietal dura, and after stripping backwards along the ganglion and incising the dura in order to expose the root, I experienced persistent bleeding. This was

due doubtless to an individual vessel or cluster of vessels not commonly encountered; it effectively obscured the field. It was then that I thought of securing the trigeminal trunk in the posterior fossa before it pierced the dura, and proceeded to do it.

It will be recalled that the trigeminal trunk pierces the dura at a point immediately behind the trigeminal groove in the crest of the petrous, a point which, as I shall show (Figure I), can be made out with sufficient accuracy at operation. The nerve trunk thereafter runs for an appreciable distance in a dural tunnel under the variable superior petrosal venous sinus and the attachment of the tentorium before entering the *cavum Meckelii*, as I have demonstrated at operation by passing a blunt probe along it. Incision of the dura in the lateral wall of this tunnel is likely to wound the petrosal sinus and obscure the field. Therefore I go still further posteriorly for the trunk.

As far as I know this procedure is original, though I will say at once that it is difficult to imagine that it has not been contemplated, perhaps done, by the many distinguished workers in this field, and done in a manner far more effective than I am capable of. But, be this so or not, I offer the method not because it may be original, but that it seems a safe and certain means of approaching the trigeminal trunk when from involvement of its ophthalmic division such a course may appear imperative.

Perhaps I should state here that I have done the operation in only two instances, but for this I offer no apology. A third patient, already quoted, will be operated on shortly. He is now having trichlorethylene inhalations. Among the 468 patients of Horrox and Poppen, be it remembered only 2·9% had the first division affected, 4·7% had combined first, second and third division involvement, and 3·5% involvement of first and second—a total of about 11% of cases of ophthalmic involvement. Taking this series as representative, I should have dealt with a total of something like thirty cases of *tic douloureux* in its various forms. I have had at the most one-third of this number. In the two patients who have had the operation, and in the third now waiting, divisions one and two have been involved in each instance. It is to be borne in mind too that in this country we do not draw from so large a population as do our more favoured and experienced American *confrères*.

Briefly, then, I avulse the trigeminal trunk in the posterior fossa. I feel it best to suture the lids at the time, and to keep them closed for at least six months. On the patient's part it is not an unreasonable price to pay for what surely must be permanent immunity. I did not do it in my first case, and despite precautions the patient developed a serious keratitis. Strange to say, in my patients the resultant unilateral paralysis of the masticatory muscles matters not at all. Mastication is not affected other than by the numbness of the buccal aspect of the cheek, nor has there developed in either case any of that

deformity which has been imagined as a result of unopposed action of the other side or from muscle wasting.

To me an even more potent argument for not sparing the motor root has been an inability to distinguish it. Apparently others have also experienced this difficulty in sectioning the trunk at or near the ganglion. Stookey quotes Frazier[10] as saying that if the motor root

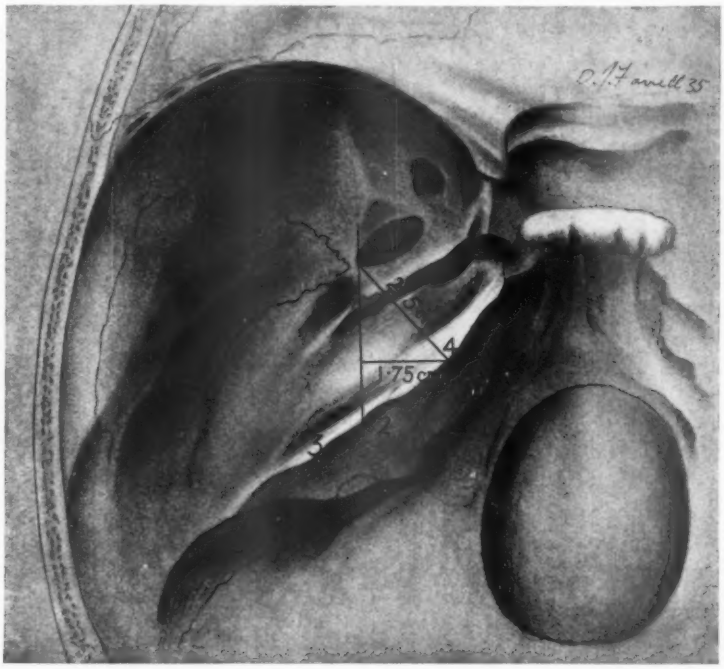

FIGURE I. 1 = *Foramen ovale*. 2 = Internal acoustic meatus. 3 = Petrous crest. 4 = Trigeminal groove on petrous crest.

is indistinguishable he cuts into the lateral bundles by sections, searching each section for the motor root.

An ordinary operating table is used with the patient in the half sitting attitude. An anæsthetized subject tends to slide down in a dental chair. The head is turned well over to the opposite side. The light used is an ordinary overhead shadowless one of the type now in common use. Special instruments used are a small (children's) Lack's tongue spatula for retraction of the dura, a small raspatory curved near the end such as is used by rhinologists for septal separation, a

small hook to steady the nerve before applying forceps and cutting, and a narrow bladed tenotome for incision of the dura and nerve section.

I prefer the Hartley-Krause approach. A very small horseshoe incision leaves no facial scar whatever. I would stress that it is important for reasons of access to remove the floor of the temporal fossa downwards and medially to the infratemporal crest—some scattered outer fibres of the external pterygoid muscle are removed in

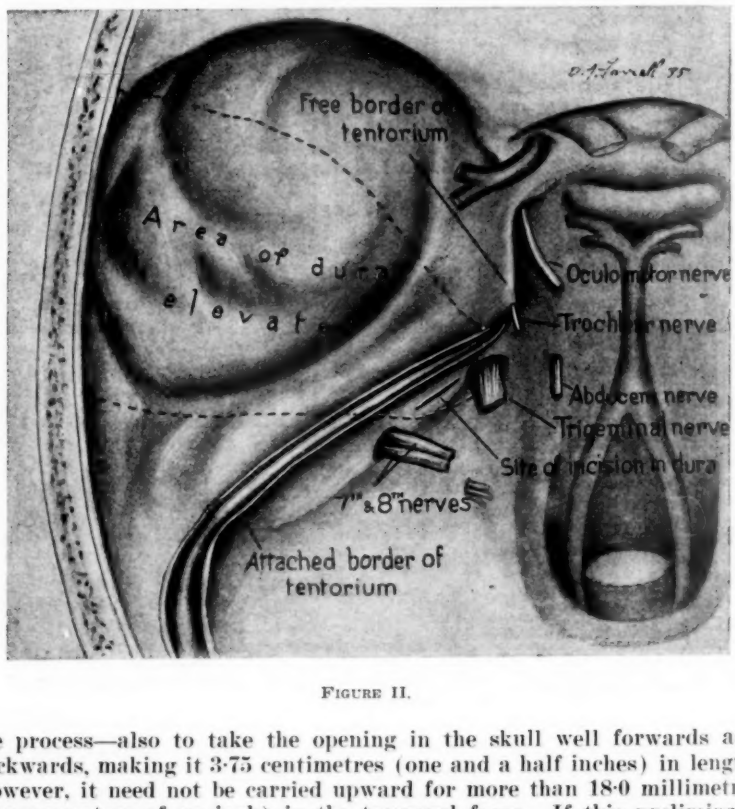

FIGURE II.

the process—also to take the opening in the skull well forwards and backwards, making it 3·75 centimetres (one and a half inches) in length. However, it need not be carried upward for more than 18·0 millimetres (three-quarters of an inch) in the temporal fossa. If this preliminary care is taken, the access in later stages so admirably depicted by the artist, Mr. Farrell, in Figure III will be found to be by no means exaggerated. I have not deliberately punctured the dura to draw off cerebro-spinal fluid. The *foramen ovale* is identified by gentle scraping up of the dura from the floor of the middle fossa. Time is of no importance, for two or three hours produce no appreciable shock, pro-

vided gentle packing with narrow gauze strips is continually resorted to to check the oozing.

The outer edge of the *foramen ovale* is the guide to all future procedure, that and a line passing directly backwards from it in the same sagittal plane (Figure I). This line not only marks the outer edge of the *foramen ovale*, but it also touches the outer limit of the internal acoustic meatus (Figure I)—an important point to observe in avoiding possible injury to the seventh and eighth nerves in the following stages. Medial to this line and backwards from the *foramen ovale* the dura is next elevated (Figure II) from the anterior surface of the petrous for a postero-medial distance of up to 2·5 centimetres and for a depth not exceeding 1·75 centimetres (Figure I). The crest of the petrous is first encountered in the medial posterior depth of the area of separation and at the site of the trigeminal groove. The crest is then cleared laterally and posteriorly as far as the line passing backwards from the edge of the *foramen ovale* and already referred to. Of course, it will be found expedient, even before this stage, to carry the original separation of the dura in the floor of the middle fossa backwards to this extent.

The two points on the petrous crest are now the guides; that is, the site of the trigeminal groove and the point of intersection of the sagittal level of the outer margin of the *foramen ovale*—the latter because it represents accurately the outer level of the internal acoustic meatus, and enables one henceforward to avoid it. The dura between them (but keeping a fraction deep to the lateral point to miss the meatus and its contents) is separated on downwards and backwards over the crest and along the steeply sloping posterior surface of the petrous for a distance of 6·0 millimetres (a quarter of an inch) (Figure II). This is as far as it is necessary to go. By going no further it also renders it practically impossible to injure the seventh and eighth nerves, even if the separation of the dura happens to be carried too far laterally on the posterior petrous surface. Nor do I think that a reasonable sense of touch would permit one to dip over the edge of the meatus if the edge of the small curved raspatory were kept in gentle contact with the bony surface.

The superior petrosal sinus contained within the attached border of the tentorium, with the dura immediately beyond, is next elevated by the tip of the spatula, and an incision is commenced in the dura just medial to the line of the *foramen ovale* and internal acoustic meatus. The incision is carried medially and slightly forward for one centimetre parallel to the petrous crest and 6·0 millimetres (a quarter of an inch) below its level (Figure III and inset). When I say that the dura below the level of the petrous crest is incised in this way, I mean of course that part of the dura which was in that precise situation before being separated by the raspatory and elevated by the tip of the spatula so that it comes into view above the line of the petrous crest. I commence the incision laterally and prolong it medially and forwards

till the nerve comes into view. I repeat here that the perspective in Figure III has been very accurately represented by the artist.

The tension produced in the dura by the tip of the spatula causes the small opening to gape in a very accommodating manner, and immediately medial to it the glistening trigeminal trunk is viewed as it passes upwards and forward across the void of the posterior fossa to pierce the dura at almost the same level as the incision in the dura. A curious effect of this tension is that the nerve is arched and at first sight appears

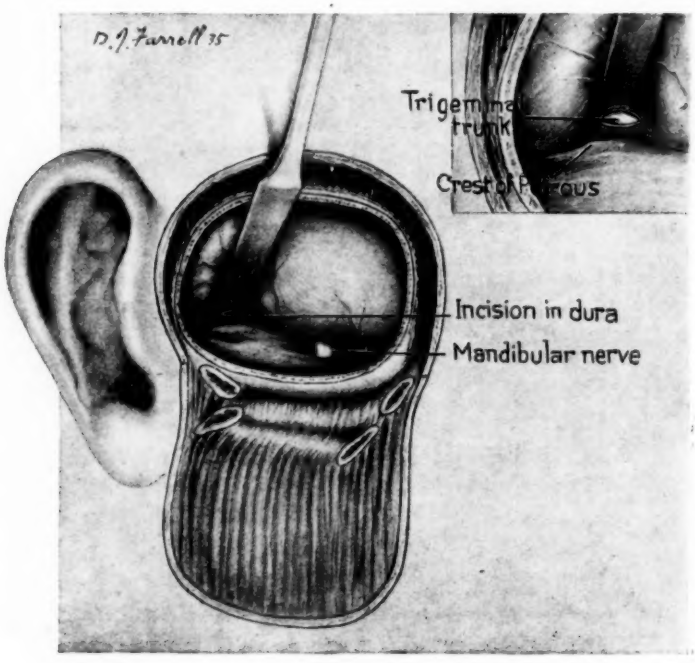

FIGURE III.

to take an unusual course (inset, Figure III). To confirm the identity of the nerve I pass a bent probe through the roomy opening in the dura by which it gains the *cavum Meckelii*, and direct it on into the cave itself. The capacity of the latter has surprised me.

A hook is passed round the nerve trunk to steady it before it is grasped with a mosquito forceps. It is divided with a tenotome in front of the forceps and by gentle traction on the latter is avulsed from its pontine attachment. Up to 18·0 millimetres (three-quarters of an inch) of nerve trunk comes away.

Perhaps the whole operation can be followed better by reference to Figure II than from my description. No drainage is provided.

Injury to the oculomotor, trochlear or abducent nerves need not be feared. The first two are placed on a higher level and more deeply in the unlighted posterior fossa. I have not seen them. The trigeminal trunk is lying free, no separation or definition of it from dura is necessary—a very great advantage possessed by this method—and the use of the bent probe as I have described is conclusive as to its identity.[1]

CONCLUSIONS.

A procedure is described with offers, as I believe, a simple and certain way of approaching the fifth nerve trunk. It is immaterial to the merits of this method of approach whether the nerve trunk when exposed is dealt with by partial section or by avulsion. I prefer avulsion.

The operation is suited to those cases of *tic douloureux* with ophthalmic (first) division involvement.

Though the approach is by the recognizedly safe subtemporal route, the nerve is secured in the posterior fossa where it lies alone and free of any dural envelopment.

The operation is completely safe when the safeguards indicated are observed with reasonable care.

No attempt is made to display the Gasserian ganglion. The outer margin of the *foramen ovale* is displayed only that it may serve as a landmark.

The vital terrain of the operative activities is marked by only three structures: the middle meningeal artery, the outer edge of the *foramen ovale*, and the petrous crest. The site of the trigeminal groove on the petrous crest is presumed from approximate distances. No great danger attaches to a minor miscalculation of this distance.

Time is unimportant in the performance of the operation. It may be abandoned at any time for any reason, and completed a week later without disability to operator or patient.

There is no undue difficulty as regards access and lighting. To draw a comparison I would say, from having performed both, that it is easier though more tedious than Royle's anterior approach to the upper thoracic sympathetic ganglion.

Any difficulty which may arise will only be such as is likely to be met with in any subtemporal operation, namely, diploic bleeding, oozing

[1] Stookey[11] surprises me when he says that: "Rarely the abducens nerve may be caught in attempts to reach the most mesial part of the dorsal root. In these instances it is possible that the nerve may lie in a more lateral position than is usually the case." Two things occur to me from this. Firstly, I do not think that Stookey from this vague remark has experienced such an accident. Secondly, though the abducens nerve may at times lie a fraction more laterally than usual, Stookey in his operation on the trigeminal root carried out at the posterior extremity of the Gasserian ganglion could not possibly injure it unless he inadvertently pierced either the inner wall of the ganglion sheath or the inner aspect of the trigeminal "tunnel". This could not happen with a clear view. But any possibility of its happening would seem a strong argument in favour of the operation I describe, where any such occurrence seems impossible.

as the dura is separated, high ridges and deep furrows in the floor of the middle fossa, control of the middle meningeal artery, and the minor variations in depths and distances inseparable from operations performed on different individuals with skulls of varying shapes and sizes. Ways and means of overcoming these obstacles are too well known to need recapitulation here.

ACKNOWLEDGEMENT.

I cannot praise too highly the delightful artistry of Mr. Farrell, of the Anatomy Department, University of Sydney, in producing the illustrations or his intelligence and enthusiasm in their preparation.

REFERENCES.

(1) "Nelson's Surgery", Volume ii, page 557.
(2) G. Horrox and J. L. Poppen: "Trigeminal Neuralgia: Experiences with and Treatment Employed in 468 Patients During the Past Ten Years", *Surgery, Gynecology and Obstetrics*, Volume lxi, September, 1935, pages 394 to 402.
(3) "Nelson's Surgery", Volume ii, page 558. (Quotes in "Surgical Treatment of Trigeminal Neuralgia by Differential Section of the Dorsal Root", read before the New York State Medical Society, March 30, 1926.)
(4) "Nelson's Surgery", Volume ii, pages 558 to 559.
(5) "Nelson's Surgery", Volume ii, page 566.
(6) "Nelson's Surgery", Volume ii, page 561.
(7) G. Horrox and J. L. Poppen: *Loco citato*, page 402.
(8) Choyce's "System of Surgery", Volume iii, page 563.
(9) Rowlands and Turner: "The Operations of Surgery", 1927, Volume i, page 397.
(10) "Nelson's Surgery", Volume ii, page 561.
(11) "Nelson's Surgery", Volume ii, page 566.

Surgical Technique.

HALLUX VALGUS AND MINIMUS VARUS.

By D. J. GLISSAN,
Sydney.

IN 1925 Walter Truslow[1] demonstrated the existence, in adults who were suffering from *hallux valgus*, of a deformity affecting the first tarso-metatarsal joint. As a result of this deformity the metatarsal comes to lie in a varus position in relation to the mid-axis of the foot and the long axes of the outer metatarsals. Truslow named this condition *metatarsus primus varus*, and put forward the view that it constituted the prime factor in the deformity of *hallux valgus*. He ascribed the tarso-metatarsal deformity to the presence of a congenital anomaly, affecting either the first cuneiform or the base of the first metatarsal, which caused the line of the joint to lie in an oblique rather than a transverse axis, with a corresponding obliquity of the metatarsal. In some cases he considered that the presence of a supernumerary ossicle (the intermetatarseum) between the contiguous bones might provide the deforming factor.

He outlined an operation to correct the primary deformity by removal of a suitable wedge of bone from the tarso-metatarsal region, and to overcome the deflection of the great toe by a plastic operation upon the outer side of the metatarso-phalangeal joint.

It is evident from a perusal of his paper and the subsequent discussion, that Truslow and those who discussed the paper were not aware that *hallux valgus* is found frequently in children and young adults.

I have been able to confirm his observation in practically every case of *hallux valgus* occurring in an adult which I have seen since I read his paper, and certainly in every case in which I have encountered this deformity in children and young adults. The deformity is encountered not only in these subjects, but if careful histories are sought, many adults will be found to have had it since childhood and early adult life. (See Figures I, III and IV.)

The importance and originality of Truslow's observation are outstanding, and it is with some diffidence that I venture to criticize his work. I cannot, however, accept his view as to the best operative attack for the relief of the tarso-metatarsal deformity and the restoration of function in feet afflicted with *hallux valgus*. The area

FIGURE I. E.K., female child, aged nine years. The well marked deformity is seen; one foot only is shown.

from which he resects his bone wedge involves an articulation, and this would appear to constitute an important objection to his proposal. A more serious ground for criticism, however, is that in children Truslow's operation must involve radical interference with two growing epiphyses, with the possibility of subsequent serious loss of growth in the bones concerned.

In order to overcome these disadvantages I have for a number of years practised a technique, based entirely upon his teaching, which achieves the object that he desires, but which avoids the objections that have been described.

Through a suitable incision, the base of the first metatarsal is laid bare of periosteum. From the area just distal to the base in adults, and distal to the epiphyseal plate in children, a wedge of sufficient thickness is cut from the shaft.

FIGURE II. J.P., male, aged fifteen years, showing deformity before operation.

FIGURE III. J.P., showing correction after operation.

The base of the wedge is directed laterally, whilst the apex falls short of the medial border of the shaft by the thickness of the medial cortical layer of bone. An osteotome is placed at the apex of the resultant space in the shaft, with the blade directed proximally and slightly medially, and the division of the medial cortex is completed.

The result of this manœuvre is that a spike of bone is left attached to the cut end of the shaft. By engaging against the medial side of the basal fragment, when the varus inclination of the shaft is corrected, this spike prevents the whole shaft from travelling towards the second metatarsal, and allows the necessary rotation of the shaft to take place in order to approximate the head of the first to that of the second metatarsal. In my earlier operations I found that, after carrying the wedge right through from side to side, the whole shaft tended to move laterally whilst still retaining some of its original varus inclination.

The position of the spike and its function will be clear from a study of Figure VIII.

The lateral aspect of the first metatarso-phalangeal joint is exposed, and a longitudinal cut is made right down to the bones and across the line of the joint. The soft tissues are stripped subperiosteally and turned aside so as to release the bones from the grip of the shortened ligamentous tissues on the outer side.

The deviation of the great toe can now be readily corrected, and it will be found that the manœuvre of correction also levers the metatarsal bone into a straight position and closes the wedge-shaped gap in its shaft.

The parts are sutured. A light plaster case is applied about the foot extending as far forward as the line of the metatarso-phalangeal joints. A *hallux valgus* splint in aluminium, patterned after that of Jones, is applied over the plaster

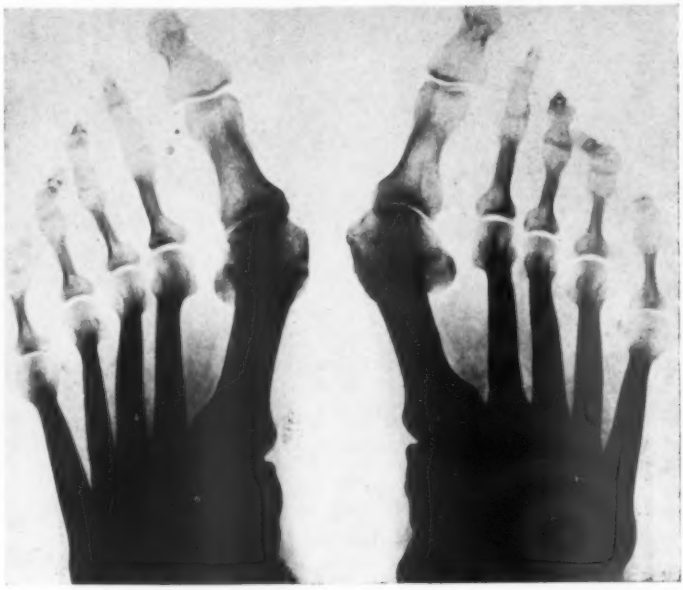

FIGURE IV. P.M., female, aged thirty-five years, showing long standing deformity.

to control the toe and to maintain correction. This disposal allows active movements at the joint to be commenced at the end of ten or fourteen days, whilst the divided metatarsal is splinted and controlled by the plaster for at least five weeks.

As an addendum, I wish to stress the importance of combining with the above operative measures the overcoming of those contractures of the remaining toes which form an integral feature of all advanced cases of *hallux valgus*.

Minimus Varus.

I wish to draw attention to a deformity which affects the little toe, and which is analogous in all respects to *hallux valgus*. I am not aware of any description of this condition in the literature.

Out of compliment to Truslow I would suggest that the basic deformity affecting the tarso-metatarsal joint should be named *metatarsus quintus valgus*, and that of the little toe *minimus varus*.

The deformity may occur as a primary condition affecting only the little toe. Figure IX illustrates such a case. The patient, a young girl, complained of pain about the outer side of the right foot of some months' duration. Examination disclosed swelling and tenderness of the soft tissues overlying the metatarso-phalangeal joint, whilst the little toe was deflected in a varus deformity towards

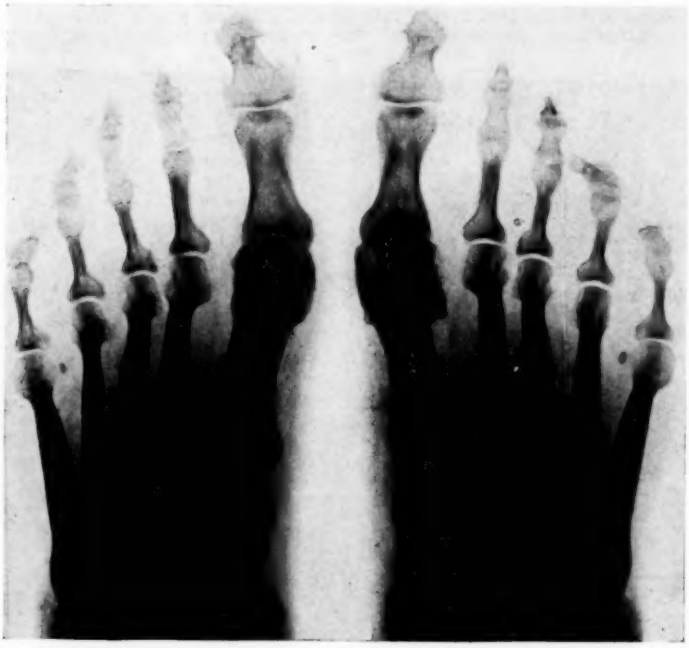

FIGURE V. P.M., six months after operation.

the fourth toe. Pressure applied over the neck of the fifth metatarsal corrected the displacement of the little toe; and the patient obtained relief from the application of a band of adhesive plaster applied about the forefoot so as to maintain the metatarsal in correct relation with the mid-axis of the foot. A study of the skiagram will show the shadow of the thickened soft tissues and the deviation of the metatarsal in a valgus position at the tarso-metatarsal articulation.

The little toe may be deformed in the direction described as a part of a general deforming process of all the toes. Figure X illustrates this type. The forefoot has been the site of a severe infective process affecting all the joints, and the condition under review can be seen to exist to a marked extent, the little toe and its metatarsal exhibiting gross deviation from their normal axes.

In the majority of cases the chief complaint is of a callosity overlying a swollen little toe; the little toe is found to be inclined towards the tip of the

FIGURE VI. E.H., female, aged forty-five years, showing right and left feet before operation.

FIGURE VII. E.H., four years after operation.

FIGURE VIII. Shows retaining spike of bone on medial side of shaft.

FIGURE IX. Shows early *metatarsus quintus valgus*; note thickened soft tissues over the lateral aspect of the right fifth metatarsal head.

FIGURE X. Shows gross deformity of all toes with marked *metatarsus quintus valgus.*

FIGURE XI. Shows the same case after operation for correction of all deformities. Note method of dealing with the metatarsal and proximal segment of the little toe. The base of the phalanx has not been removed, but the cosmetic and functional result was not lessened.

fourth toe, and may underlie or rest upon it. In a smaller percentage of cases patients complain of swelling and tenderness about the lateral aspect of the metatarso-phalangeal joint, and examination reveals the typical deformity with signs of adverse pressure and friction about the painful area.

Treatment.—In no circumstances should the little toe be amputated. When it is contracted without associated varus deformity it is sufficient to fillet the basal segment. A similar procedure suffices to cure minor cases of *minimus varus*, but when gross deflection of the metatarsal is present, an osteotomy should be performed in order to overcome it, and in addition the basal segment should be filleted. (See Figure XI.)

The results obtained from this simple operation are very gratifying not only from the point of view of relief of symptoms, but also of the appearance of the foot.

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(1) Walter Truslow: "Metatarsus Primus Varus or Hallux Valgus?", *Journal of Bone and Joint Surgery*, Volume vii, January, 1925, page 98.

Case Reports.

UNUSUAL COMPLICATIONS OF SPHENOIDITIS.

By H. M. Jay,
Adelaide.

R.D., A FEMALE, aged sixty-two years, was admitted to the Adelaide Hospital on April 13, 1934.

Sixteen years earlier the patient had undergone a mastoid operation on the right side. Two weeks prior to her admission to hospital she began to suffer from pain over the region of the maxillary antra. This pain became progressively worse, especially when bending the head or stooping, and it soon spread to the retroorbital region. There was a profuse, thick, yellow discharge from the anterior and posterior nares. Prior to the present illness there had been no affection of the eyesight, but with the advance of her illness she suffered greatly from diplopia. A week before her admission to hospital the pain became continuous and the patient noticed a swelling in front of the right ear. At the time of her admission the swelling had become much larger and was very sensitive.

On examination, the patient appeared to be comfortable and exhibited no signs of distress. The pupils of the eyes were of equal size and active. The fundi showed engorgement and tortuosity of the veins, especially on the left side. There was complete paralysis of both external rectus muscles.

The tongue was clean and moist. The pharynx was congested and a large amount of post-nasal discharge was present. Much pus was lying along the floor of the nose.

The right ear had been successfully operated upon for mastoiditis, and there was no sign of active disease in it. The left ear was normal in appearance. The whole of the right side of the face was swollen and tender, the swelling being greatest below the zygoma, but extending upwards into the temporal fossa and well above the level of the upper margin of the orbit. The tissues were hot and œdematous and gave an impression of deep suppuration.

The heart, lungs and abdomen were normal. A little albumin was present in the urine. The patient's temperature was 39·2° C. (102·6° F.), the pulse rate 96, and the respiratory rate 22. An injection of 30 cubic centimetres of anti-streptococcal serum was given.

X ray examination revealed a well marked mural thickening of the antra with increased density, very suggestive of pathological thickening of lining membrane. The sphenoids showed increased density consistent with pathological changes.

On April 14, 1934, under ether anæsthesia, the septum was resected, the sphenoidal sinuses were drained, the right antrum was cleaned out and the affected ethmoidal cells on each side were removed. The left antrum was drained. Macroscopically the severity of the clinical signs appeared to be out of all proportion to the conditions found at operation. The latter might be classed as extensive, but not such as would be likely to give rise to unusual complications. Following the operation the patient's temperature fell from 40·1° to 36·8° C. (104·2° to 98·2° F.). A second injection of antistreptococcal serum was then given.

On April 16, 1934, the patient's temperature began to rise again, and for the next week fluctuated between 37·5° and 39·7° C. (99·6° and 103·6° F.).

On April 17, 1934, coarse crepitation and râles could be heard at the lung bases. The diplopia had entirely disappeared and the facial swelling was barely noticeable.

From this time until the patient's death from pneumonia on April 23, 1934, there was no return of the local signs. At no time was there anything in the signs or symptoms to suggest cavernous sinus thrombosis. An autopsy was not obtainable.

Comment.

The unusual features of the case were as follows:

1. The widespread involvement of the soft tissues on the right side.

2. The bilateral abducens paralysis in the absence of any cavernous sinus thrombosis or obvious involvement of the soft tissues on the left side.

3. The dramatic rapidity of disappearance of these symptoms following operation.

I have been able to find only one reference to any similar case, and that occurs in Hajek's work, "The Nasal Accessory Sinuses". In this he refers to a case reported by Scholz in 1872, in which pus burst through the body of the sphenoid and infiltrated the soft parts, burrowing out to appear in a situation identical with the one reported in this paper. Apparently there was no abducens paralysis in Scholz's case, but the cavernous sinus was involved.

Wells P. Eagleton, in his work, "Cavernous Sinus Thrombophlebitis", mentions a number of cases in which infection spread to surrounding structures from the sphenoidal sinus, but in none of these, nor in the notes quoted by him from the reports of others, is there any mention of a case similar to the one herein reported.

The Australian and New Zealand Journal of Surgery.

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VOL. V. APRIL, 1936. No. 4.

ON THE FUNCTIONS OF A COLLEGE.

THERE will be few to question the opinion that the first and chief function of a college is to foster and encourage the science or craft in which its constituents are interested.

Therefore, the chief function of the Royal Australasian College of Surgeons is to encourage surgery in Australia and New Zealand. By what methods can this be attained? The most common and usually the first method by which colleges have set out to encourage surgery, has been to establish diplomas, the acquisition of which by their students entails some intensive study for the purpose of reaching the required standard, with what is of scarcely less importance from the point of view of those responsible for the financial stability of the college, the compensatory payment of fees. Unless a college is heavily endowed, this is the only means by which it can be maintained, and even if endowed in part, diploma fees in most cases form the substantial means of subsistence of a college of surgeons.

Such diplomas may be established by means of examinations, but as the diploma of the Fellowship of the Royal Australasian College of Surgeons is not in itself an evidence of fitness to practise, that is, a primary qualification, it has been held by those responsible for its introduction (and I think wisely) that the usual method of estimating the fitness of a candidate for a diploma may be dispensed with, in whole or in part, and that an estimate of his fitness should rest rather upon the production of evidence of clinical experience and of work done. The latter must include operative experience, research and preparation of papers of surgical interest.

In passing, it may be remarked that this is an innovation in the method of granting a diploma or degree which is worthy of consideration by all licensing bodies and universities. The multiplication of degrees and diplomas urgently demands simplification of the methods by which they are granted if the candidate is not to have the whole of his career in medical school and hospital spoilt by the ever present spectre of an examination looming ahead. But this subject, interesting and important as it is, is a digression from the question under discussion.

A second means by which a college may encourage surgery is by the formation of a library. This should be primarily a reference library for the instruction of surgeons, not an educational library for the aiding of students to pass examinations, which is the function of the library of a university or medical school. It will be evident that the aims of the two kinds of library, as well as the type and number of books necessary to them, are not similar, nor do they even march on parallel lines.

One may with justice be acquitted of insular prejudice if one cites the library of the Royal Society of Medicine in London as an almost perfect example of what is needed. The library should be open several evenings in the week, as well as by day; it must provide small rooms which a man engaged in a serious piece of work may reserve, his books of reference being kept available from day to day. It must allow a Fellow to apply for and receive by post or other means of transport a certain number of volumes. These will not include books of intrinsic value or such as those the loss of which would seriously diminish the value of a series, that is, single numbers of a valuable periodical.

It is another function of such a library to provide any applicant with a list of papers on any subject he may desire, and with photostatic abstracts from any such papers as may deal with the question in which he is interested. The supply of photostatic copies will do much to

diminish one of the chief troubles of such a library, that is, the abstraction from it of a volume which another reader may require. For this purpose all books commonly in use are kept in duplicate (and some in considerable numbers), of which one copy only may be borrowed, the other remaining always in the library for reference.

The Royal College of Surgeons of England, or the Corporation of Surgeons, as it was first called, does not appear to have been alive to the value of a museum—at least, there is no evidence to this effect. At any rate, there was no museum in Lincoln's Inn Fields until about the year 1813. Hunter had left his collection to the British Government; the Government in turn offered it, with the sum of £15,000 for building expenses, to the Corporation, the members of which were themselves financially responsible for its upkeep, and the building for its housing was opened in the year mentioned.

There can be no question that the Hunterian Museum is the most valuable asset of the Royal College of Surgeons, and its preservation and extension and the furtherance of all the multifarious objects, such as research, which arise therefrom, comprise the most important duties of the President and Council.

If the collection which bears Hunter's name came to the Royal College of Surgeons by chance, it is only fair to say that by purchase and gift it has for many years been multiplied in size; it has been the chief care of the Council, and, under succeeding conservators, first one and then another of its aspects have been fostered, so that as a pathological museum it has few rivals and is also of worth in comparative and human anatomy and in anthropology.

Under the supervision of the Conservator of the Museum, the Department of Surgical Research must be set in motion. Work will be carried out by young surgeons who are holders of scholarships, and for a three or five year period are free from immediate financial anxiety, and so can give their minds wholly to research.

Very few young men are gifted towards research, and even so most of the research done is sterile in its application to the alleviation of disease. For these reasons it is important that research should be undertaken as soon as possible, provided the right type of worker is available.

The student will work under the guidance of the Conservator, who, in order to provide the maximum of help, must have a knowledge of physiological experimental methods.

To turn from its internal or domestic policy to its external duties, the College must acquire the right to visit and inspect those hospitals in which its Fellows of the future are to be trained. One of the conditions which must be fulfilled by a candidate before he may endeavour to obtain the Fellowship of the Royal College of Surgeons of England is six months' surgical residency. Hospitals in which this post may be held must be recognized for that purpose. This necessitates visitation, so that the Royal College of Surgeons may know that the required standard is maintained. Visitation has been universally welcomed by the administrators of the hospitals concerned. Further, the recommendations of the visitor frequently provide for the keen members of the surgical staff a lever which may be made use of in the provision for necessary improvements.

These, then, seem to me to be the elementary functions of a college. It is, of course, obvious that accommodation adequate for the carrying out of these duties must be provided.

One word only about a library, museum and accommodation for research. These, to my thinking, should be all under one roof; if possible, under the same roof as the administrative offices of the college, or at any rate upon the same plot of land. Many reasons for this are obvious. Not the least of its practical advantages is the family or team spirit which is engendered by the daily intercourse of administrators and scientists.

A bold and far-seeing policy is wise for pioneers in such a building. Nothing is more distressing than to find that, owing to a Lilliputian cast of mind, buildings, which have only been in use for perhaps a generation, are already outgrown and cannot be extended.

So I "will" the Council to build for the future, not for the present. It were better for them if posterity's verdict accused them of megalomania than of being small minded.

C. H. FAGGE.

Surgery in Other Countries.

[In this column will be published short résumés of articles likely to be of practical value from Journals published in other countries and not readily accessible to surgeons in Australia and New Zealand.]

Fracture and Dislocation of the Vertebræ.

Lorenz Böhler: "*Wirbelbruche und Wirbelverrenkungen*", *Der Chirurg*, August 15 and September 15, 1935.

Böhler has written a series of articles on fractures of the spine, two of which are of special interest, being on treatment. He states that in all cases of fracture or dislocation, immediate reposition is the rule, whether paralysis is present or not. If it is not, the earlier the reduction, the greater chance there is for the compressed vertebral bodies to regain their normal shape. After ten days they will not do so. If paralysis is present, Böhler considers the need

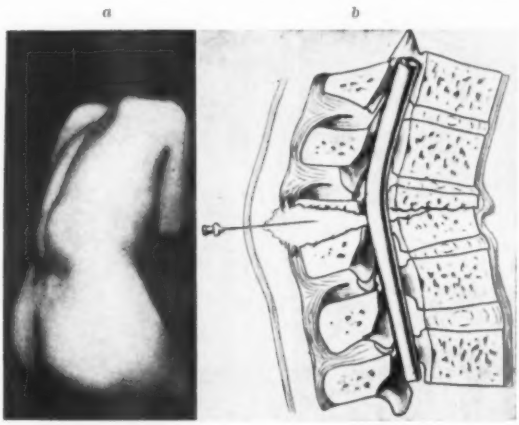

Figure I.

for immediate reposition to be just as urgent as is that for immediate operation in perforated peptic ulcer. The radiogram is apt to be deceptive as to the amount of cord trauma present. It is of the first importance to a quick recovery that pressure should be removed from all compressible nerve substance at the first possible moment. Even if the cord is irreparably damaged, reposition of the fragments will end the severe pain at the time, and will prevent the later onset of nerve pressure pain. Simple fractures without dislocation, with some angular deformity as their only sign, can be easily corrected by placing the patient on his back with a suitable pad under the angle, followed by application of a plaster casing.

Cases of fracture with dislocation, but without locking of the articular processes, are treated by hyperextension. In all these manœuvres local anæsthesia is the rule. The danger of doing damage to the cord under anæsthesia has been a difficulty in the management of spinal fractures. Schnek started using local anæsthesia for this purpose in 1930, and Böhler has used it ever since. After infiltration of the skin and subcutaneous tissues, a long spinal needle is introduced five to six centimetres to one side of the mid-line, and pushed down between the transverse processes until it reaches the fractured body. Ten cubic centimetres of a 1% "Novocain" solution are then injected into the blood clot, and pain and rigidity of muscles immediately disappear. Often blood clot is found immediately under the deep fascia and erector muscles. This communicates directly with that round the fracture, and injection of 20 cubic centimetres of 0·5% "Novocain" solution will effect all that is desired. Figure I, *a* and *b*, illustrates this process.

The method of treatment of fractures of the cervical region is shown in Figure II. A wooden strip, 150 centimetres long and three to four centimetres wide, is laid on the table under the patient's back. A Glisson's sling attached to a pulley fixed to a hook in the wall is fixed in place, and counter-pressure is obtained by padded shoulder pieces fixed to the table. The surgeon holds the head in slight flexion, and feels the relative positions of the fragments, while the assistant slowly and carefully pulls on the pulley. Fifteen to twenty-five kilograms of pull will separate the articular processes, and one can feel the cranial part of the column slip backwards. Tension is then eased off to five or six kilograms, and X ray films are taken.

FIGURE II.

FIGURE III.

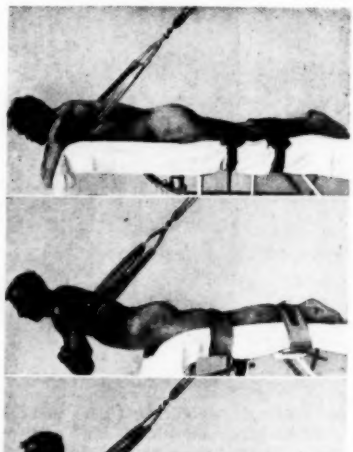

FIGURE IV.

A plaster bandage is then applied at once, the application being made very easy by the wooden strip which holds up the head when the end of the table is dropped. Unparalysed patients get up at once, and undertake free exercises, including the carrying of sandbags on the top of the head, to strengthen the neck muscles. If the patient is paralysed in both lower limbs, these are put on a Braun's splint, and by means of tibial nails weights are made to put a seven kilogram pull on them in such a way as to raise the pelvis. This is not intended as extension to the vertebral column, but as an aid to nursing, and to prevent bed sores. The plaster is worn for five or six months. With early release from bed and Böhler's exercises, stiffening never results from this long stay in plaster.

Dorsal fractures are treated as shown in Figure III. The separate table for the patient's head and dropping the head of the main table make access to the neck and buttocks easy for the application of plaster. The neck, in a position of slight extension, must be included in the plaster casing for all cases

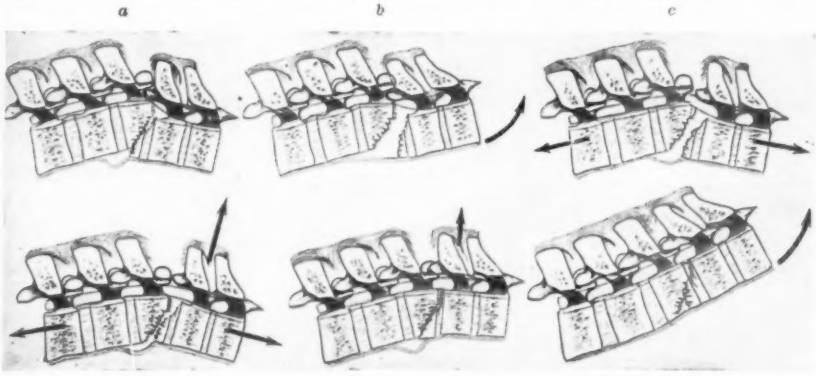

FIGURE V.

of fracture of the spine above the tenth dorsal vertebra. The after-treatment is the same as for cervical fracture. Treatment of fractures in the lumbar region is illustrated in Figure IV. Plaster is applied as soon as the films show that reduction has been achieved, and after-treatment is the same as for fractures at higher levels.

When the articular processes are so dislocated that they become locked, a different procedure is required. Locking is often extremely difficult to recognize, but it may be assumed to be present if the above measures fail to reduce the deformity. Longitudinal traction in flexion is then applied. The principle of this is explained serially in Figure V, *a*, *b*, *c*, *d*, *e*, and *f*. The patient is placed on his face, over a thick pillow, pelvis and legs being fixed to the table. Strong steady traction is then applied by pulley to the arms and thorax, a scale showing the tension used. The unlocking of the articular processes can be both seen and felt. It is checked by X rays, and then a sling twenty to twenty-five centimetres wide is put under the chest, and an upward pull on this pulls the upper part of the column backwards into place. Hyperextension and the usual after-treatment can then be used with success.

When the locking of the articular processes is not recognized or reduced, operative measures may be necessary, and these consist of resection of the upper articular process involved, sufficiently to allow of reduction.

ARTHUR E. BROWN.

INJURY TO THE BILIARY AND PANCREATIC DUCTS IN THE RESECTION OF PENETRATING DUODENAL ULCERS.

Professor Dr. G. Brandt: *"Verletzungen des Gallen und Pankreasganges bei der Resektion des Penetrierenden Duodenalgeschwures"*, *Der Chirurg*, June 15, 1935, page 396.

BRANDT lays emphasis on the danger to the bile and pancreatic ducts in the resection of a posteriorly penetrating duodenal ulcer, and illustrates six methods by which the damage may be repaired (Figure I).

He criticizes the insertion of a tube that will pass down into the bowel after the sutures holding it in place have been absorbed, on the grounds that one has no control over the length of time during which the tube will remain

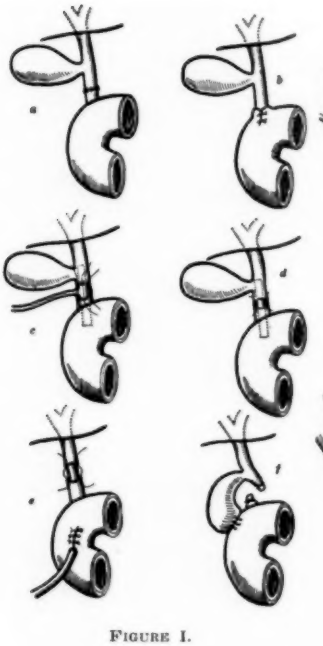

FIGURE I.

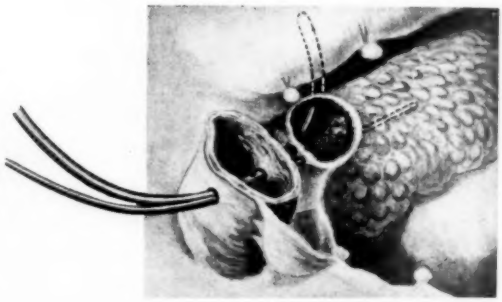

FIGURE II.

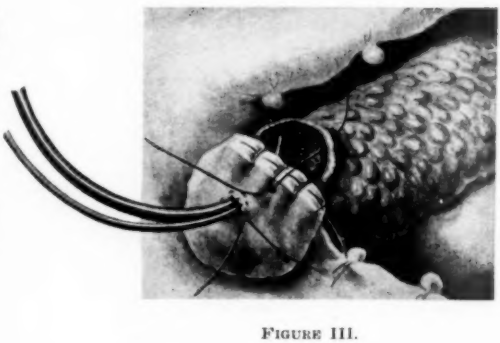

FIGURE III.

in position. Too short a time, he believes, will lead to stricture, or, as in a case that he reports, to abscess round the unhealed ducts. His own case was one in which both ducts were cut across in the ulcer wall, and he carried out transduodenal drainage of them both. The tubes had a lateral opening inside the duodenum, to allow of the secretions passing into the bowel, and were secured by a purse-string suture to the anterior duodenal wall. The technique is illustrated by Figures II and III. Bile and pancreatic juice escaped from the tubes for the first four days, after which they passed entirely into the bowel. The tubes remained in place for four weeks, and the healing and after history of the patient

were uncomplicated. Brandt expresses doubt whether in all cases four weeks would be enough to insure full healing of the ducts before removal of the tubes, but considers that for the avoidance of future stricture that time is a minimum requirement.

ARTHUR E. BROWN.

THE SURGERY OF URETERAL STONE.

Professor Dr. H. Boeminghaus (Marburg): *"Zur Chirurgie der Harnleitersteine"*, *Zeitschrift für Urologie*, Volume xxix, 1935, Number 1.

BOEMINGHAUS states that the condition of 80% to 90% of patients admitted to the clinic suffering from ureteral stone had been wrongly diagnosed; the most usual diagnosis was appendicitis. The best method of diagnosis, and also of relieving pain, is ureteral catheterization. With X rays a negative result is often

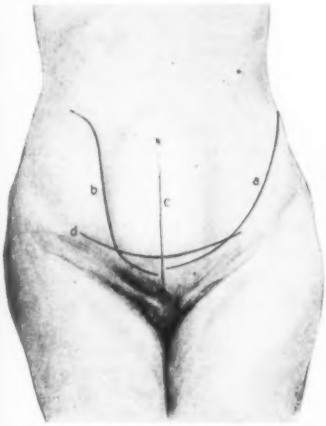

FIGURE I.

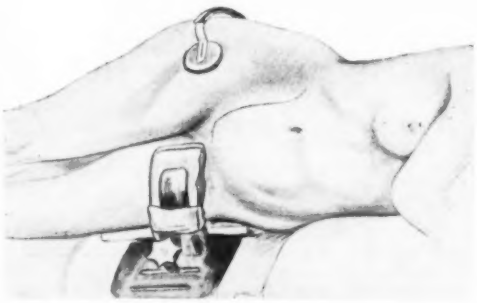

FIGURE II.

obtained by plain films. Contrast filling is essential. Spontaneous passage of the stone occurs in from 50% to 90% of cases, according to various authors, and conservative methods should always be given a good trial. The best of these is catheterization, with the instillation of a little oil or glycerine. The patient should lead a life of activity, and definitely not be put to bed. If the ureter is not completely blocked, these measures may be persisted in for six to twelve months, or more. The following, however, are considered urgent indications for early operation: all cases of single kidney when conservative methods have not succeeded in twenty-four hours; complete stoppage of the ureter combined with infection; complete blockage of the ureter without infection, if the stone does not appear likely to pass easily. The pain may vanish, yet it may indicate the destruction of the kidney, which may be avoided if the delay in operating is not too great. The onset of infection, occasional bouts of fever, rigors *et cetera*, give the indication to cease conservative methods.

Access may best be obtained for upper segment stones within 11 centimetres of the kidney by the lumbar incision. For the middle segment the "abdomino-lateral paraperitoneal route" is advised. The incision is shown in Figures I and II. The peritoneum is stripped off the abdominal wall, the surgeon standing in front of the patient. When the vertebral bodies are reached, he changes place with

his assistant to deal with the ureter. The only difficult point in the separation is near the internal inguinal ring. The point of crossing of the ureter over the iliac vessels is an excellent point of identification, which is often not easy. In women, when the stone is low down, it may be necessary to cut some fibres of the broad ligament, or even to tie and cut the uterine artery. Working too far forward in the pelvis may give rise to trouble owing to bleeding from the venous plexuses. Freeing of the terminal part of the ureter is the most difficult feature of the operation, and may be facilitated by snicking the posterior rectus sheath, or the rectus itself at its insertion to the pubis. Where only the lower segment of the ureter needs to be exposed, the pararectal is preferred to the median incision. If the median route is used it is made easier if the bladder is first extraperitonealized, especially in cases of bilateral exploration, both ureters being easily accessible. Small incisions are dangerous, especially in the pelvic segments. A ureteric catheter inserted before the dissection is wise, providing easy transureteral drainage. A catheter must always be passed after removal of the stone, as otherwise other stones or strictures may be missed. Suture of the ureter is unimportant, if the edges lie easily together, if the egress to the bladder is free, and drainage is used. If there is much periureteral sclerosis, or any suggestion of a stricture, an 8 Charrière catheter should be inserted, and the wound allowed to granulate. The inlying catheter should be generally used if much infection or much renal damage is present. It must not be formalin sterilized, as necrosis of the ureteral lining may be caused. The catheter may stay in one or two weeks, provided it is draining well; if not, it is better removed. Sometimes a long-impacted stone may have so severely damaged the ureteral wall that it is difficult to determine what to do with it. Stricture, fistula and final nephrectomy are the likely results. In the terminal part of the ureter, resection of the damaged part and reimplantation of the proximal end into the bladder is the best method of dealing with it.

After these operations, fistulæ arising after four to five days are common, but usually mean nothing, and close easily. No fistula should be reoperated on in under six months.

If calculous anuria has existed too long for the patient to stand a long operation on the ureter, double transrenal urinary fistulæ should be made, and Boeminghaus combines this with decapsulation.

ARTHUR E. BROWN.

RESECTION OF THE STOMACH IN GASTRIC AND DUODENAL ULCER.

Professor Dr. Kirschner and Dr. Phillippides (The Surgical Clinic, University of Tübingen; Director, Professor M. Kirschner): *"Die Bewertung der Resektion zur Ausschaltung beim Ulcus Ventriculi et Duodeni"*, *Der Chirurg*, March 15, 1934.

THE authors make the following introductory statement: "We believe it to be a fact that the statement, frequently made, that the operation for resection of chronic duodenal ulcer, in which the ulcer-bearing area of the duodenum with two-thirds of the stomach is resected—the so-called 'radical operation'—is the operation of choice for duodenal ulcer, cannot, according to our way of thinking and our experience, be regarded as true." The "radical" operation presents many technical difficulties, and the immediate mortality in the hands of an inexperienced surgeon is high. Sometimes the ulcer is embedded in a tumour mass, and is irremovable. The duodenum is surrounded by vital structures, and its isolation involves resection of structures which are difficult to repair. Closure of the severed duodenum is difficult, and not always effective. In fat patients these difficulties become greater.

Under difficult and unsuitable conditions the only other operations which may be employed are gastro-enterostomy and exclusion with resection, which was suggested by Finsterer fifteen years ago.

The authors consider and contrast the value of these three operations under the following heads: (i) immediate mortality; (ii) late complications—post-

operative perforation or bleeding from the duodenal ulcer, jejunal ulcer; (iii) permanent cure.

Danger of the Operation.—In the authors' clinic the operative mortality after gastro-enterostomy was greater than after the exclusion with resection. Gastro-enterostomy—57 cases—had a 10·5% mortality. Resection with exclusion —80 cases—had a 3·75% mortality. This agrees with the figures of other large German clinics, in which the mortality rate for the exclusion with resection is given as from 1·5% to 6%, and that for gastro-enterostomy as from 2% to 12%. In the opinion of the authors, therefore, the immediate mortality of the exclusion with resection operation is no greater than that of gastro-enterostomy.

Late Complications—Post-Operative Bleeding or Perforation.—In both gastro-enterostomy and exclusion with resection the ulcer is not removed, as it is in the radical operation; it is therefore possible for a perforation or bleeding to occur before the exclusion has time to produce a beneficial effect on the ulcer. In the authors' cases—80 exclusions with resection, 57 gastro-enterostomies—there was no case of bleeding or perforation. However, Nissen has reported a case in which the ulcer became perforated five days after an exclusion with resection operation. Two cases in which a lethal perforation occurred after a gastro-enterostomy have been reported. After both gastro-enterostomy and exclusion with resection operation, bleeding can occur from the unhealed ulcer which is left in the body, but it can be attributed to injury caused by the operation. Among the 57 of the authors' cases in which gastro-enterostomy was performed, a severe post-operative bleeding occurred in four; among the 80 cases of exclusion with resection a severe post-operative bleeding occurred in four. The exclusion with resection operation consequently carries with it less danger of post-operative bleeding.

Jejunal Ulcer.—The authors investigated the incidence of jejunal ulcer in their gastro-enterostomy and exclusion with resection operations. They point out that theoretical considerations go to show that both the first and the second phase of gastric secretion would probably be increased by the retention of the pylorus and the antrum in the body. This increase of acid would predispose to the formation of jejunal ulcer. They point out also, however, that if the pylorus is removed, and the exclusion is made distal to the pylorus, difficulties and dangers are then nearly as great as those of the radical operation, and that there is little to be gained from the point of view of safety.

In the exclusion with resection operation, if the anastomosis be properly made, and if sufficient stomach is taken away to bring about an adequate reduction in the percentage of acid, the authors hold that there is no danger of the formation of jejunal ulcer. They also state that with a Pólya gastro-enteroanastomosis with a retrocolic jejunal loop emptying is quicker and better than with a Billroth II operation, and that thereby stagnation of gastric contents in the stomach or any regurgitation of these contents into the blind duodenal loop is avoided. The exclusion is made four centimetres proximal to the pylorus. In 46 exclusion with resection operations, over a period of five to one and a half years, they found no sign of jejunal ulcer. In all those patients who were subsequently examined an adequate reduction of acidity was found, even when pre-operative examination revealed a high acidity. From a study of their statistics, the authors feel sure that the retention of the pylorus and part of the antrum does not increase the danger of jejunal ulcer. Any danger in this respect is due to the fact that not enough of the stomach has been removed in order to cause adequate reduction of acidity. They refer to Denk's figures of 4·3% of jejunal ulcers, of Finsterer's 7·5%, and Flörcken's only 0·5% after an exclusion with resection operation.

In contrast to these statistics referring to the incidence of jejunal ulcer after exclusion with resection, and the high percentage of the incidence of jejunal ulcer after gastro-enterostomy, they give the following figures: Denk's collected statistics, 2·8% of cases; Zukschwerdt and Eck (Enderlen), 15%; Hohlbaum (Payr), 10%; Flörcken and Steden, 6·7%; Ramb, 4%; von Haberer, 2%.

After considering a great mass of material, they come to the conclusion that the incidence of jejunal ulcer is certainly no greater after the exclusion with resection operation than it is after gastro-enterostomy.

Permanent Cure.—Permanent cures after the exclusion with resection operation are much more numerous than after a gastro-enterostomy. As proof of this, the authors quote from the literature as set out in Table I.

TABLE I.

Permanent Cures.

Surgeon.	Exclusion with Resection Operation.	Gastro-Enterostomy.
Denk	81·7%	67·0%
Flörcken	94·2%	58·0%
Zukschwerdt and Eck (Enderlen)	85·0%	50·0%
Finsterer	88·6%	
Wilmanns	93·0%	
von Redwitz		59·8%
Hohlbaum (Payr)		62·0%
Kaspar (Hochenegg)		83·0%

Since 1927, Kirschner has performed 80 exclusion with resection operations. Of these, 30 have been done during the last eighteen months. Forty-six of the patients were followed up, and forty-one were traced; in three the ulcer was pre-pyloric; in 13 it was pyloric; in 25 it was duodenal. Since 1927, he carried out 57 gastro-enterostomy operations. Six patients died after operation. Forty-six have been operated on for more than eighteen months. The situation of the ulcer in these cases was: pre-pyloric, 2; pyloric, 20; duodenal, 23.

A comparison of the results was as shown in Table II.

TABLE II.

Result.	Exclusion with Resection.		Gastro-Enterostomy.	
Trouble-free without diet	36 = 88%	95	20 = 46%	58
Trouble-free with diet	3 = 7%		5 = 12%	
Partly trouble-free	2 =	5	6 =	14
Troubles not better	0 =	0	12 =	28
Total	41	100	43	100
Full work capabilities	34 = 83%	88	26 = 60%	81
Limited work capabilities	2 = 5%		9 = 21%	
Incapable of work	5 =	12	8 =	19
Total	41	100	43	100

After investigating all the exclusion with resection operations which they have carried out since 1927, the authors come to the conclusion that the curative results are practically as good in those cases in which the pylorus has not as in those in which it has been removed. They also have no doubt that their careful investigations show that the clinical results of the exclusion with resection operation are better than those of gastro-enterostomy. They believe that in duodenal ulcers which are very chronic and difficult to remove, the exclusion with resection operation is to be preferred to that of gastro-enterostomy. They state that in the year 1927, on the Continent, gastro-enterostomy was the operation of choice. In 1933, it was almost completely replaced by the operation of resection with exclusion.

The authors believe that the radical resection of duodenal ulcer, as practised by them and others, is the operation of choice, but only in suitable circumstances: the surgeon must be skilled, hospital facilities must be good, anatomical conditions must be favourable, and the general condition of the patient must be good. They estimate that about 60% of the duodenal ulcers which come to operation are treated by the radical operation, about 30% are treated by resection with exclusion operation, and under 10% by gastro-enterostomy. These figures seem to represent the opinion of the authors with regard to the choice of operation for the treatment of duodenal ulcer.

The authors raise the point whether the remarkable clinical results of the exclusion with resection operation are not just as good as those of the radical resection of the ulcer, and suggest that, therefore, it is unjustifiable to inflict on the patient the extra risk of the radical operation.

H. B. DEVINE.

THE RELATIONSHIP BETWEEN THE THYREOID GLAND AND THE CENTRAL NERVOUS SYSTEM.

Hans Voss (Hamburg): "*Über die Beziehungen zwischen Schilddrüze und Zentralnervensystem*", *Klinische Wochenschrift*, June 22, 1935.

Voss opens a very interesting paper with a report of a case of Graves's disease of two years' standing, in which there developed a right-sided hemiplegia, and also twice a transient and finally a permanent paralysis of the extrinsic eye muscles. He proceeds to discuss the biochemical and neurological relations between the thyreoid gland and the central nervous system. The literature and work which he quotes reveal a very close connexion and interaction between the thyreoid gland and the vegetative centres in the mid-brain, particularly those round the third ventricle. He quotes Gaupp's findings of a definite secretory activity in some of these nuclei, the hormone from which produces definite symptoms of hyperthyreoidism in men. There is definite evidence of a hormonic and possibly a sympathetic control exercised over the thyreoid by this area. On the other hand, there is no difficulty in showing that the thyreoid by its secretion has a very definite influence on the mid-brain centres in return. Clinical, experimental and histological evidence all bear this out. Meyer considers thyroxin to have primarily a nutritive or catalytic action directly on the peripheral cells and, secondarily, a regulatory effect, extending to toxicity, on them through the sympathetic paths. Voss points out that the barbiturates which have been shown to be selective to the brain stem nuclei, are directly antagonistic to the action of thyroxin. And chemical investigations into the iodine content and distribution in the brain also bear witness to the close relation between the medulla and mid-brain and the thyreoid.

Therefore, in a case of Graves's disease with neurological symptoms the origin may be primarily thyreoid, or primarily in the central nervous system. Probably the whole body regulating mechanism, thyreoid mid-brain nuclei, the other endocrine glands, the sympathetic system and peripheral organs are so closely interlinked that serious damage to one part of it produces dislocation of function of the whole.

ARTHUR E. BROWN.

Reviews.

ACUTE INTESTINAL OBSTRUCTION.

Acute Intestinal Obstruction. By MONROE A. MCIVER, M.D.; 1935. New York: Paul B. Hoeber, Incorporated. Imperial 8vo, pp. 430, with 62 illustrations. Price: $7.50.

THE author of this monograph on acute intestinal obstruction is well fitted to undertake such a task, for his writings and researches on the subject are so well known that it is certain he would deal with the essential problems which have to be faced, and would not be content to produce a mere summary of voluminous literature. The work is divided into three parts.

In Part I a general picture of the disease is presented. In discussing the anatomical and pathological aspects, the author admits that little can be added to the classical writings of Treeves of over thirty years ago. The various types of mechanical obstruction are dealt with, and there is a good description of the ætiology, pathology and clinical aspects peculiar to each. Perhaps the most important chapters of this first part are those dealing with the alterations in physiology attendant upon this disorder, notably changes in body fluids and dehydration.

Part II, devoted to diagnosis and treatment, deals with these aspects of the disease very well indeed, but it is in Part III of the book that surgeons will find most to interest them. This part of the work is devoted to an inquiry into the cause of death of patients suffering from intestinal obstruction. This aspect of the problem has always appealed to us as being the one which, if solved, should provide therapeusis that might be successful in checking the condition when established. The oft-repeated exhortation of early diagnosis has become a spent force, for, despite it, the mortality of the disorder remains the same. It has become obvious to research workers, particularly the biochemist, that the solution may lie in other directions, for with diagnostic imperfections as they do and must continue to exist, the surgeon must expect to receive a large proportion of his cases of intestinal obstruction with the condition well established. The *post mortem* examination of fatal cases will usually show some obvious morbid anatomical change which is the immediate cause of death, but on other occasions the findings may not be sufficient to account for the clinical picture and death of the patient. As the author points out, the problem is to explain the severe illness of these patients in the earlier stages of the condition rather than to determine the immediate cause of death, which is so often some obvious complicating factor. From time to time theories have been suggested as to the cause of death. Toxæmia produced by absorption from the stagnant bowel contents or even from the peritoneal cavity itself, peritonitis from permeation of the devitalized bowel by bacteria, the absorption of hypothetical non-bacterial toxins, dehydration—all have at times received the accusation of the surgical world. It is perhaps an advance to have it made clear that the cause of death may vary according to the different circumstances attending each particular example of the condition. This aspect of the question is brought out most forcibly and most ably by the author. He cites in detail the experimental work carried out for the last decade along these lines, and draws from it what we believe to be very sound conclusions. He points out that there is most certainly a difference to be found in the cause of death in cases in which the obstruction is high in the intestine and when it is low, and that either type of case may be complicated by interference with the circulation of the intestine. Very briefly, it appears that fluid and chloride loss are important factors in high

obstruction, and that, in low obstruction, the question of distension certainly has a great bearing on the outcome, for the capillary circulation in the bowel must be interfered with and is a factor in initiating the degenerative process in the bowel which may eventually result in its becoming permeable to a toxin. The symptoms and death in obstructions characterized by interference with the mesenteric circulation can, according to the author, be best explained on the basis of a toxæmia caused by the action of bacteria multiplying in the necrosing intestinal wall.

We have stressed the third part of the work dealing with the cause of death because the conclusions of the author in this respect are reflected in the second part of the work, where his excellent advice on the treatment of the condition is set out. To any surgeon of average experience the diagnosis of a case of intestinal obstruction and the actual technique for its immediate relief should present no great difficulty. The real battle often begins after operation, and it is during this critical time that a proper understanding of the exact morbid physiology attending the disease is invaluable to the surgeon. If he wishes to acquaint himself with all that is worth knowing about this problem, he will find it in Dr. McIver's excellent monograph.

DESCRIPTIVE AND APPLIED ANATOMY.

Anatomy, Descriptive and Applied. By H. GRAY, F.R.S., F.R.C.S.; Twenty-Sixth Edition; edited by T. B. Johnston, M.B., Ch.B.; 1935. London: Longmans, Green and Company. Royal 8vo, pp. 1548, with 1,323 illustrations, of which 611 are coloured. Price: 42s. net.

WE welcome the twenty-sixth edition of this volume, which for so long has been a standard anatomy textbook. The chief change noticed is the introduction of the British revision of the B.N.A. terminology throughout the text, which is a definite improvement. The rewriting of the section on osteology has emphasized the more important details by describing the minor bone markings in small type; however, as modern teaching places such importance on building up anatomy from the dry bones, it is doubtful if this change is desirable.

While sections on applied anatomy add interest to the subject, it is probable that short paragraphs on anatomical variations and abnormalities would be of more practical value. One hundred and three new illustrations have been added, and they retain the high standard which has always been a feature of this volume.

The present edition will continue to find favour in all English-speaking medical schools.

SURGICAL PATHOLOGY.

A Text-Book of Surgical Pathology. By C. F. W. ILLINGWORTH, M.D., F.R.C.S., and B. M. DICK, M.D., F.R.C.S.; Second Edition; 1935. London: J. and A. Churchill. Royal 8vo, pp. 719, with 301 illustrations. Price: 36s. net.

THE second edition of Illingworth and Dick's textbook of surgical pathology has appeared. The first edition, which was published four years ago, has established itself as a valuable addition to the surgeon's library, and has been most useful to those students seeking higher degrees in surgery.

The new edition has been enlarged and amended. Additions have been made in several sections, of which the outstanding is that relating to the problems of ossification and to the rare group of bone diseases such as *osteochondritis juvenilis* and the post-traumatic rarefactions. The authors deserve congratulation for the explicit exposition of these (as well as of other conditions) in the relatively small amount of space available.

Extensive alterations have been made in other sections, for example, the general summary of tumour development, chronic mastitis, the ductless glands *et cetera*. Here again the incorporation of recent work makes this edition valuable for reference. Also the lists of references at the end of chapters have been increased and have been well chosen. The increase in size of the book is justified by the amount of new material incorporated. There is a considerable number of new illustrations, some of those appearing in the first edition having been replaced.

This volume well sustains the standard of the former edition, and is one that can be thoroughly recommended to senior students and graduates, for whom it is intended.

DISEASES OF THE THYREOID GLAND.

Diseases of the Thyroid Gland. By A. E. HERTZLER, M.D., with a chapter on Hospital Management of Goiter Patients by V. E. Chesky, M.D.; Third Edition, entirely rewritten; 1935. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary Limited. Royal 8vo, pp. 348, with illustrations. Price: 45s. net.

THE third edition of "Diseases of the Thyroid Gland", by A. E. Hertzler, contains an excellent description of the pathology, symptomatology and treatment of these diseases. The author stated in the preface to the first edition of the book that the advantage of practising in a small country hospital was that, as the hospital drew its patients from the immediate community, it was possible to study the end results more adequately than was possible in large centres. In the preface to the third edition he sums up the results of this study in the statements that: "The disease of goiter is a continuous process, the normal termination of which is a cardiac death"; and that: "Experience has tended to more and more radical operation culminating in complete thyroidectomy in selected cases."

In discussing exophthalmic goitre, he points out that nothing short of operation is capable of making any impression on the disease, though, as the disease tends to regress, other measures may receive credit for any favourable variations which may ensue. He points out that though X rays in some hands seem of value as a palliative measure, their main advantage is that the patient feels that something is being done, and that it thus aids in playing for time until the acute stage has passed. Hertzler emphasizes the stupidity of giving iodine at any time preceding the immediate pre-operative period. To employ the language of its own country, the book is full of "wisecracks" and "horse sense", and will be much appreciated by all surgeons and others interested in this subject.

TUMOURS OF THE BLADDER.

Tumours of the Urinary Bladder. By EDWIN BEER, M.D., F.A.C.S.; 1935. London: Baillière, Tindall and Cox. Medium 8vo., pp. 166, with illustrations. Price: 16s.

A BOOK by Edwin Beer on the surgery of bladder tumours is most welcome. Few have had such enormous experience in these cases as the author, who is a pioneer in the use of transurethral diathermy. The book is well printed and illustrated, and can be read from cover to cover in an hour or two. In spite of this brevity, it is nevertheless a very complete and adequate treatise on every phase of the subject.

On reading, one is struck by the fact that in the author's opinion there is no single method which is applicable to every type of case. He uses diathermy and implantation of radon seeds transurethrally, while suprapubically he freely makes use of partial cystectomy as well as diathermic destruction and radium. Frequently, as he says, he has used all three methods of attack in the same case.

He is not very enthusiastic about radium in these conditions, and considers that if resection is possible and is not carried out, the surgeon has failed in his duty. His quoted figures for radium are poor, but it is obvious that he resorts to radium alone only when radical destruction or removal is out of the question. Consequently it is only the most advanced and hopeless cases which enter into his table of statistics. Deep X ray therapy only in a very occasional case in his experience has given good results.

Not the least valuable feature of the book is the personal manner in which it is written, and it is at once obvious that the author is drawing almost entirely from his own experience. This work can be thoroughly recommended to all surgeons who are interested in the subject.

AIDS TO SURGERY.

Aids to Surgery. By C. A. JOLL, M.S., M.D., B.Sc., F.R.C.S., Hon. LL.D., and R. C. B. LEDLIE, M.B., B.S., F.R.C.S.; Sixth Edition; 1935. London: Baillière, Tindall and Cox. Foolscap 8vo, pp. 622, with illustrations. Price: 3s. 6d. net.

THIS compact little volume contains an immense amount of condensed information on all branches of surgery, except that of the eye. The book is primarily intended for students, and serves as a useful book for rapid revision. While the principles of treatment are outlined, no attempt is made to indicate details. The section on the thyreoid gland gives a very good summary of Mr. Joll's views on disorders of this gland. As a handy pocket reference book for students this volume can be recommended.

UROLOGY FOR GENERAL PRACTITIONERS.

Urology in General Practice. By A. E. ROCHE, M.A., M.D., M.Ch., F.R.C.S.; 1935. London: H. K. Lewis and Company, Limited. Demy 8vo, pp. 366, with illustrations. Price: 17s. 6d. net.

THIS book should prove of real value not only to the practitioner, for whom it has been written, but also to the surgeon interested in urology. The author has succeeded in his object of giving a sound and conservative conception of present-day urological practice. The book has no pretensions to being a scientific work, but in a comparatively short space deals with the investigation and treatment of the common urinary disorders.

The chapter on hæmaturia can be specially recommended to the practitioner, and the following extract, dealing with this symptom of paramount importance, cannot be over-stressed: "The interests of the patient are not best served when hæmaturia is treated by drugs and rest in bed. Especially important is it to avoid such blind therapy with symptomless hæmaturia, since a neoplasm may thus be overlooked, and possibly allowed to progress to an inoperable stage, before hæmaturia recurs, or before it recurs copiously enough to compel serious attention. With hæmaturia of unknown origin, investigation should always precede treatment. . . . It is only when exhaustive investigations have failed to discover a local cause for hæmaturia of unknown origin that one is justified in awaiting further developments, confident that some general or primarily medical condition, such as arteriosclerosis or oxaluria, is responsible."

The first chapter is devoted to the general investigation of a urological case, the second deals with urinary symptoms, and the succeeding chapters are arranged in the customary anatomical classification. Torsion of the spermatic cord and torsion of the hydatid of Morgagni are discussed at length, for "they are of comparatively frequent occurrence, but commonly misdiagnosed . . . and so mistreated, as epididymitis or epididymo-orchitis" (preface). Though these conditions are less uncommon than hitherto thought, they can scarcely be classed

as of "comparatively frequent occurrence". Their description is based largely on the author's personal observations and experience, and should be of particular value to the surgeon interested in making a pre-operative diagnosis. From the practitioner's viewpoint, as Keys writes: "Torsion should be suspected as the cause of all fugitive attacks of orchitis." And again: "The acute attack is accompanied by such severe pain as to demand operation in any case and then the diagnosis is made."

More space could have been given to the urinary infections. No mention is made of the beneficial effect of dilatation of the urethra for the common but debilitating dysuria and frequency occurring in middle-aged women. Recently Ormond has written a most instructive paper on this subject, entitled "Non-Purulent Urethritis in Women" (*Journal of Urology*, May, 1935). It is interesting to note that Hurry Fenwick ("The Cardinal Symptoms of Urinary Disease", 1893), in his chapter on undue frequency of micturition, writes: "Digital dilatation of the female urethra is so readily and safely performed and is followed often by so much improvement, that it is looked upon, unfortunately, as a specific, and is often employed quite regardless of the cause of the cystitis."

The final chapter gives a brief *résumé* of recent advances in urological treatment. Here the author might be accused of being ultra-conservative, but seeing that this book has been written as a guide for the practitioner, one feels he is thoroughly justified in his attitude.

The basic principles of urology have been set out clearly and well, and the text is freely illustrated with plates which may be readily interpreted.

Obituary.

E. STARR JUDD.

IT was with feelings of great sorrow that we learned of the death of Dr. E. Starr Judd, of Rochester, Minnesota, United States of America. The late Dr. Judd, who was a senior surgeon at the Mayo Clinic, graduated at the University of Minnesota Medical School in 1902. Observers of Dr. Judd's work were impressed with the quiet, confident manner in which he approached surgical problems, with the masterly precision displayed in dealing with such problems, and with his amazing knowledge of the human anatomy. He was an exponent of the *en bloc* method of dissection.

Dr. Judd was possessed of a charming personality, and he was at all times anxious and eager to help surgeons from Australasia who were visiting America. Many Fellows of the College are indebted to him for help and guidance received at his hands, and they retain vivid recollections of his hospitality.

Proceedings of the Royal Australasian College of Surgeons

ANNUAL MEETING.

At the annual meeting of the Royal Australasian College of Surgeons held at Sydney from March 18 to 21, 1936, the following business was transacted.

Election of Office-Bearers.

State and Dominion Committees.

The following were elected members of the State and Dominion Committees:

New South Wales: A. J. Aspinall, G. Bell, Professor H. R. Dew, B. T. Edye, J. W. S. Laidley, Sir John McKelvey, Guy Antill Pockley.

Queensland: J. C. Hemsley, H. S. McLelland, B. T. Mayes, A. V. Meehan, W. N. Robertson, A. G. Anderson.

South Australia: A. M. Cudmore, I. B. Jose, L. C. E. Lindon, P. S. Messent, Bronte Smeaton, T. G. Wilson.

Tasmania: F. W. Fay, J. Bruce Hamilton, D. H. E. Lines.

Victoria: T. E. Victor Hurley, Fay Maclure, J. Newman Morris, Henry Searby, C. Gordon Shaw, John H. Shaw, B. T. Zwar.

Western Australia: F. J. Clark, H. B. Gill, D. D. Paton.

Dominion of New Zealand: Sir H. T. D. Acland, F. S. Batchelor, F. Gordon Bell, Sir Donald McGavin, Sir Carrick Robertson, D. S. Wylie.

State and Dominion Hospital Committees.

The Hospital Committees in the various States and in the Dominion of New Zealand were re-elected. The names of the members are as follows:

New South Wales: A. J. Aspinall, C. E. Corlette, T. Hamilton, Sir John McKelvey, J. Brooke Moore, C. Read, H. H. Schlink, R. B. Wade, Ralph Worrall.

Queensland: E. D. Ahern, G. P. Dixon, J. C. Hemsley, A. E. Lee, A. V. Meehan, H. S. McLelland.

South Australia: A. M. Cudmore, H. Gilbert, H. M. Jay, I. B. Jose, Sir Henry Newland, T. G. Wilson.

Victoria: A. E. Brown, Sir Hugh Devine, T. E. Victor Hurley, Fay Maclure, J. Newman Morris, Alan Newton, C. Gordon Shaw, Henry Searby, B. T. Zwar.

Dominion of New Zealand: Sir H. T. D. Acland, Sir Louis Barnett, F. Gordon Bell, Sir Carrick Robertson, Sir Donald McGavin, T. D. M. Stout, H. M. Wilson, D. S. Wylie.

Election of Fellows.

The following Fellows of the College were elected by the Council:

Fellow Admitted under the Old Regulations.

New South Wales: Richard Granville Waddy.

Fellows Admitted after Examination by a Board of Censors.

The following were elected Fellows in General Surgery:

New South Wales: George Augustus Hardwicke, Victor John Kinsella.

New Zealand: Geoffrey Michael Fulton Barnett, James McMurray Cole, John Dreardon, John Havelock North, Douglas Gordon Radcliffe, Lindsay Sangster Rogers, George Edwin Waterworth, John Maurice Watters.

The following were elected Fellows in Ophthalmology:

New South Wales: Thomas Boyd Law.
New Zealand: Duncan Campbell Macdiarmid.

The following were elected Fellows in Laryngo-Otology:

New South Wales: Norman Harding Meacle.
New Zealand: William George Bridgman.
Western Australia: Noel Millar Cuthbert.

Notices.

THE BRITISH POST-GRADUATE MEDICAL SCHOOL.

THE College wishes to draw attention to the announcement of the British Post-Graduate Medical School on page xxx of the advertisements.

NEW DEVELOPMENTS IN SURGICAL EQUIPMENT.

THE attention of Fellows is drawn to pages xviii and xxvi among the advertisements, which illustrate some recent developments in surgical equipment. The Editorial Committee is responsible for the selection of the equipment illustrated thereon. The publishers will be pleased, whenever possible, to supply the names and addresses of the manufacturers to anyone requiring such information.

CONGRESS OF THE PAN-PACIFIC SURGICAL ASSOCIATION.

THE College would like to draw the attention of readers of the journal to the announcement of the Second Congress of the Pan-Pacific Surgical Association appearing on page xli of the advertisements.

Editorial Notices.

EDITORIAL communications should be addressed to the Chairman of the Editorial Committee, 57 Collins Street, Melbourne, or to any member of the Editorial Committee. It is understood that original articles forwarded for publication are offered to THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY solely, unless the contrary be stated.

Reprints can be supplied at cost price; the minimum number is fifty copies. Orders for reprints must be given when the proof is returned.

Exchange journals should be addressed to the Honorary Librarian, Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1, Victoria, Australia.

Business communications and remittances should be addressed to Butterworth and Co. (Aus.) Ltd., 8 O'Connell Street, Sydney.